

Cyclic Friction

EASA

Certificate Delivery Team
Applicant Services Department
Resources and Support Directorate

Jeff Clarke
AERO DESIGN LTD.
9888A MALASPINA ROAD
POWELL RIVER BC V8A 0G3
CANADA

Cologne, 16 January 2017

Approval Number: 10060712
EASA Account Number: 300116
Application Type: EASA STC Approval

Please state the **approval number** and your **EASA account number** in all communication with the Agency

Dear Sir or Madam,

Please find enclosed the original(s) of your document(s) issued by the European Aviation Safety Agency.

Should you have further queries, please do not hesitate to contact us. Please assist us by always quoting your EASA account number in any correspondence with the Agency.

Right to Appeal

You have the right to appeal against this decision of the Agency in accordance with Articles 44-51 of Regulation (EC) No 216/2008. The appeal notification must be filed in writing at EASA within two months from the date of notification of this decision; you are required to pay a fee when lodging the appeal. The appeal notification form and further instructions are available from the EASA website: <http://www.easa.europa.eu>.

Yours faithfully,

The Applications Management Team

This is a computer generated document valid without an EASA signature.

SUPPLEMENTAL TYPE CERTIFICATE

10060712

This Supplemental Type Certificate is issued by EASA, acting in accordance with Regulation (EC) No. 216/2008 on behalf of the European Community, its Member States and of the European third countries that participate in the activities of EASA under Article 66 of that Regulation and in accordance with Commission Regulation (EU) No. 748/2012 to:

AERO DESIGN LTD.

**9888A MALASPINA ROAD
POWELL RIVER BC V8A 0G3
CANADA**

and certifies that the change in the type design for the product listed below with the limitations and conditions specified meets the applicable Type Certification Basis and environmental protection requirements when operated within the conditions and limitations specified below:

Original Type Certificate Number: EASA.IM.R.512

Type Certificate Holder: BELL HELICOPTER TEXTRON CANADA

Type: Bell 206/407

Model: 206A, 206B

206L, 206L-1, 206L-3, 206L-4

407

Original STC Number: STC TCCA SH12-59

Description of Design Change:

Installation of Cyclic Stick Control Friction as a Direct Replacement for the Bell Cyclic Knob and Shaft Assembly in accordance with Aero Design Ltd. Document Control List DCL952-1

EASA Certification Basis:

The Certification Basis (CB) for the original product remains applicable to this certificate/ approval.

See Continuation Sheet(s)

For the European Aviation Safety Agency

Date of Issue: 16 January 2017



Volker ARNSMEIER
Light Rotorcraft Section
Manager

The requirements for environmental protection and the associated certified noise and/ or emissions levels of the original product are unchanged and remain applicable to this certificate/ approval.

Associated Technical Documentation:

- Rotorcraft Flight Manual Supplement FMS952.91 Revision 1, dated 06 August 2014
or later revisions of the above listed documents approved by EASA in accordance with the Technical Implementation Procedures of EU/ Canada Bilateral Agreement.
- Instructions for Continued Airworthiness ICA 952.90 Revision 1, dated 09 January 2015
- Document Control List DCL952-1 Revision2, dated 23 November 2016

Limitations/Conditions:

Prior to installation of this design change it must be determined that the interrelationship between this design change and any other previously installed design change and/ or repair will introduce no adverse effect upon the airworthiness of the product.

- End -

Table 3

Supplemental Type Certificates

(referred to in subpart E in Section A of the Annex I to Regulation (EC) No 748/2012)

	Flat fee ⁽¹⁾ (EUR)		
	Complex	Standard	Simple
Fixed wing aircraft			
Over 150 000 kg	60 200	12 850	3 660
Over 50 000 kg up to 150 000 kg	36 130	10 280	2 880
Over 22 000 kg up to 50 000 kg	24 090	7 710	2 620
Over 5 700 kg up to 22 000 kg (including High-Performance Aircraft)	14 450	5 140	2 620
Over 2 000 kg up to 5 700 kg (except for High-Performance Aircraft)	4 420	2 030	1 020
Up to 2 000 kg (except for High-Performance Aircraft)	1 860	1 160	580
Very Light Aeroplanes, Powered Sailplanes, Sailplanes	290	290	290
Light Sport Aeroplanes	220	220	220
Rotorcraft			
Large	46 400	6 960	2 320
Medium	23 200	4 640	1 860
Small	9 280	3 480	1 160
Very light rotorcraft	1 050	460	290
Other			
Balloons	990	460	290
Airships Large	11 600	9 280	4 640
Airships Medium	4 640	3 710	1 860
Airships Small	2 320	1 860	930
Propulsion			
Turbine engines with take-off thrust over 25 kN or take-off power output over 2 000 kW	11 600	6 960	4 640
Turbine engines with take-off thrust up-to 25 kN or take-off power output up to 2 000 kW	6 960	5 460	3 640

Jeff Clarke

From: Jeff Clarke [jeff@aerodesign.ca]
Sent: January 20, 2016 11:17 AM
To: 'Staal, Jack'
Subject: Bell 206/407 Cyclic Friction - EASA application

Hi Jack,

Please find attached the application for an EASA STC for our Bell 206/407 cyclic friction. I have reviewed the TCDS, EASA uses the same basis of certification as on TCCA TCDS H-92.

Regards,

Jeff Clarke, P.Tech.(Eng.)



Aero Design Ltd.
9888A Malaspina Road
Powell River, BC, Canada
V8A 0G3

Phone: 604.483.AERO (2376)
Fax: 604.483.2372

TCCA AMF 73-04





DESIGN CHANGE APPROVAL APPLICATION

DEMANDE D'APPROBATION D'UNE MODIFICATION DE LA CONCEPTION

Legal name and address of applicant Nom et adresse légal du demandeur		Legal name and address of prospective holder Nom et adresse légal du titulaire éventuel		Name and address for billing purposes (if different than applicant) Nom et adresse aux fins de facturation (si différent du demandeur)	
Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada V8A 0G3		Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada V8A 0G3			
Identification of aeronautical product / Identification du produit aéronautique					
Make / Marque Bell		Model / Modèle 206A, B, L, 407	Registration / Immatriculation All eligible	Serial No. / N° du série All eligible	Part No. / N° de la pièce
Request for (check appropriate box) / Objet de la demande (Cochez les carrés selon le cas)				Type Design Examination by Foreign Authority Examen de la définition de type par autorité étrangère	
<input checked="" type="checkbox"/> STC CTS <input type="checkbox"/> STC (single serial number) CTS (numéro de série simple) <input type="checkbox"/> STC (multiple serial numbers) CTS (numéros de série multiples) <input type="checkbox"/> Type Certificate Revision Revision de certificat de type <input type="checkbox"/> Revision No. SH12-59 Révision N°				<input type="checkbox"/> Repair Design Approval (RDA) Approbation de la conception de réparation (ACR) <input type="checkbox"/> Repair Design Approval - Process Repair ACR - Processus de réparation <input type="checkbox"/> Part Design Approval (PDA) Approbation de la conception de pièce (ACP) <input checked="" type="checkbox"/> Application to a foreign authority is requested La demande à une autorité étrangère est demandée. <input type="checkbox"/> Type design examination of foreign change Examen de la définition de type modification étrangère Identify Identifier EASA	
<input type="checkbox"/> Restricted Category Type of Operation Catégorie restreinte Type d'opération					
Title and brief description of modification, repair or replacement part, including effects of changes (use additional pages if necessary). Refer to CAR 521.155(b)(i) for details. Titre et brève description de la modification, de la réparation ou de la pièce de rechange, y compris les effets des changements (utiliser des feuilles supplémentaires si nécessaire). Référez-vous à RAC 521.155(b)(i) pour des détails. Installation of cyclic stick control friction as a direct replacement for Bell cyclic knob and shaft assembly.					
Applicable Type Certificate (TC) / Certificat de type (CT) pertinent					
TC No. / N° de CT H-92; IM.R.512 (EASA)		Issue No. / N° de l'édition 26		Identify State of Design / Identifier l'état de conception Canada	
The applicant is responsible for the control of product manufacture / Le demandeur est responsable du contrôle de la fabrication du produit					
<input checked="" type="checkbox"/> Yes Oui					
<input type="checkbox"/> No Non					
If no, identify who is responsible Si non, identifier qui est responsable					
Documentation to be submitted Documentation à soumettre				Applicant Demandeur	
				Submitted Soumis	
				Yes Oui	
				No Non	
Proposed certification basis Proposition de base de certification					
Certification plan in accordance with CAR 521.155(d) Plan de certification selon RAC 521.155(d)					
Applicant's remarks / Remarques du demandeur					
I hereby certify that the information contained herein is correct and complete. I agree to pay charges as prescribed in Part 1, Subpart 4 of the CARs (CAR 104-Charges). Je certifie que les renseignements figurant ci-dessus sont exacts et complets. Je m'engage à payer les redevances prescrites à la sous-partie 4 de la partie I du RAC (sous-partie 104 du RAC - Redevances).					
JEFF CLARKE Name and Signature of Applicant / Nom et signature du demandeur		VICE PRESIDENT Title / Poste		2016-01-20 Date (yyyy-mm-dd) / Date (aaaa-mm-jj)	



Application for Approval of Supplemental Type Certificate

Data protection: Personal data included in this application is processed by EASA pursuant to Regulation (EC) No 45/2001 on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data. It will be processed solely for the purposes of the performance, management and follow-up of the Application by the Agency, without prejudice to possible transmission to internal audit services, to the Court of Auditors, to the European Anti-Fraud Office (OLAF) for the purposes of safeguarding the financial interests of the European Union. The Applicant shall have the right of access to his personal data and the right to rectify any such data that is inaccurate or incomplete. Should the Applicant have any queries concerning the processing of his personal data, he shall address them to the Agency at the following address: dpo[at]easa.europa.eu. The Applicant shall have right of recourse at any time to the European Data Protection Supervisor.

1. Applicant's Reference

1.1 Your Reference

952

2. Applicant Address and Contact Data

2.1 Applicant Data

2.1.1 Name and Address (registered (business) name and address/legal seat of the company)

Applicant Number	300116	(A)DOA Reference	
(Company) Name	Aero Design Ltd.		
Street / Nr	9888A Malaspina Road		
Post Code	V8A 0G3		
City	Powell River, BC		
Country	Canada		

2.1.2 Contact Person (responsible for this application)

Title	<input checked="" type="checkbox"/> Mr <input type="checkbox"/> Ms		
Name	Clarke		
First name	Jeff		
Job title	Engineering Technologist		
Phone/Fax	Phone: 604-483-2376		Fax: 604-483-2372
Email	jeff@aerodesign.ca		

Important Note: First time applicants need to submit a copy of the company's **Business Registration** or similar legal document stating name and seat of the company together with the application. In case the applicant is not a company but a natural person, a copy of the person's **ID or passport** needs to be provided with the first application.

2.2 Billing Data (may be left blank, if same as 2.1 Applicant Data)

2.2.1 Billing Address (For the receipt of EASA Fees and Charges Invoices. EASA invoices are issued via post- mail to the address provided here.)

(Company) Name	Same as in section 2.1.1 (other name only in exceptional cases)		
Street / Nr			
PO Box			
Post Code			
City			
Country			

2.2.2 Contact Person (Responsible for ensuring the EASA terms of payment are honoured. An electronic invoice copy will be issued to the email address indicated here.)

Title	<input type="checkbox"/> Mr <input checked="" type="checkbox"/> Ms		
Name	Rekve		
First name	Wanda		
Job title	Office Manager		
Phone/Fax	Phone: 604-483-2376		Fax: 604-483-2372
Email	wanda@aerodesign.ca		

**Application for Approval of Supplemental Type Certificate****2.3 Shipping Data** (may be left blank, if same as 2.1 Applicant Data)

2.3.1 Certificate Delivery Address (for the shipping of original EASA documents)	(Company) Name	
	Street / Nr	
	PO Box	
	Post Code	
	City	
	Country	
2.3.2 Contact Person (Shipping)	Title	<input type="checkbox"/> Mr <input type="checkbox"/> Ms
	Name	
	First name	
	Job title	
	Phone/Fax	
	Email	

**Application for Approval of Supplemental Type Certificate****3. Identification of Activity****Supplemental Type Certificate**

- ☒ Simple
☐ Standard
☐ Complex

For **revisions** to an STC, please complete an Application for **Major Change/Major Repair Design** or **Minor Change/Minor Repair Design**, as applicable.

For a **transfer** to a new STC holder, please complete an Application for **Transfer of Certificate**.

Including change to approved parts of Flight Manual (FM)

- ☒ Yes
☐ No

4. Product Identification**4.1 Fees & Charges Information****Large Aeroplanes**

- ☐ > 150 000 kg
☐ > 50 000 kg ≤ 150 000 kg
☐ > 22 000 kg ≤ 50 000 kg
☐ > 5 700 kg ≤ 22 000 kg (excluding commuter)

General Aviation

- ☐ > 5 700 kg ≤ 22 000 kg (including commuter)
☐ > 2 000 kg ≤ 5 700 kg
☐ ≤ 2 000 kg
☐ High Performance Aircraft (≤ 5 700 kg)
☐ Very Light Aeroplane
☐ Powered Sailplane
☐ Sailplane
☐ Light Sport Aeroplane

Rotorcraft, Balloons & Airships

- ☐ Large Rotorcraft
☒ Medium Rotorcraft
☐ Small Rotorcraft
☐ Very Light Rotorcraft
☐ Balloon
☐ Large Airship
☐ Medium Airship
☐ Small Airship

Propulsion

- ☐ Turbine Engine > 25 kN take-off thrust
☐ Turbine Engine ≤ 25 kN take-off thrust
☐ Turbine Engine > 2000 kW take-off power
☐ Turbine Engine ≤ 2000 kW take-off power
☐ Non-Turbine Engine
☐ CS-22.H, CS VLR App. B Engine
☐ Propeller for use on aircraft > 5 700 kg MTOW
☐ Propeller for use on aircraft ≤ 5 700 kg MTOW
☐ CS-22J Class Propeller
☐ APU (Parts & Appliances)

4.2 Applicability

Type Certificate Number

EASA.IM.R.512; FAA H2SW; TCCA H-92

Type Certificate Holder

Bell Helicopter Textron Canada

Type Name

Bell 206/407

Model(s)

206A, 206B, 206L, 206L-1, 206L-3, 206L-4, 407

4.3 Airworthiness Code

CS-27

**Application for Approval of Supplemental Type Certificate****4.4 European Light Aircraft**☐ Non-ELA☐ ELA 1☐ ELA 2

please consult the completion instructions for definitions of ELA 1 and ELA 2 aircraft

5. Original Approval(if applicable)**5.1 Third Country Approval/Project N°**

Approval/Project Number

SH12-59, Issue 2

Issued by

Transport Canada

Issued on

13 February 2015

6. Description**6.1 Title**

Installation of Cyclic Stick Control Friction as a Direct Replacement for the Bell Cyclic Knob and Shaft Assembly

6.2 Description

Removal of existing cyclic friction knob and shaft assembly. Installation of replacement cyclic friction assembly. Replacement cyclic friction assembly uses a cam action to achieve desired friction instead of differential thread pitch on original assembly. Refer to Certification Plan CP952, revision 4, for further information.

6.3 Affected Areas
(including manuals)

See Certification Plan CP952, revision 4; Flight Manual Supplement FMS952.91, revision 1, Instructions for Continued Airworthiness ICA952.90, revision 1.

6.4 Re-Investigations

None

6.5 Justification

Transport Canada has issued an STC

7. Part 21 demonstration of eligibility**I declare that this application is:**☐ Within the current approved scope of work of the applicant's DOA/ADOA☐ Undertaken by another person than the applicant for, or holder of, a certificate (Part 21.A.2)

Name

(Company) Name

DOA/ADOA N°

DOA/ADOA N°

☐ Following an application for Design Organisation Approval (FO.DOA.00080) or Alternative Procedures to Design Organisation Approval (FO.DOA.00081).

Application Date

Project N°

if known

☐ Following an application for a change to the scope of work via EASA Form FO.DOA.00081 or FO.DOA.00082.

Application Date

Project N°

if known

☒ **Without DOA/ADOA**☐ Use of Article 8.2 of Regulation 748/2012



Application for Approval of Supplemental Type Certificate


- | | |
|-------------------------------------|--|
| <input type="checkbox"/> | Covered by a Certification Programme in accordance with 21.A20(c) for ELA 1 aircraft or engine/propeller installed on an ELA 1 aircraft. |
| <input checked="" type="checkbox"/> | Bilateral Agreement/Working Arrangement is in force |

**Application for Approval of Supplemental Type Certificate****8. Applicant's declaration and acceptance of the General Conditions and Terms of Payment**

I declare that I have the legal capacity to submit this application to EASA and that all information provided in this application form is correct and complete.

I have understood that I am submitting an application for which fees or charges will be levied by EASA in accordance with Commission Regulation (EC) on the fees and charges levied by the European Aviation Safety Agency, as last amended and available from <http://easa.europa.eu/> Legislation > Fees & Charges.

I acknowledge that I have read and understood the Agency's Terms of Payment (see <http://easa.europa.eu/> Legislation > Fees & Charges>General Conditions and Terms of Payment) and agree to abide by them. I declare to be aware that fees or charges, as well as all relevant travel costs must be paid whether or not the application is successful and that they might not be refundable. Moreover, I declare that I am aware of the consequences of non-payment.

20 January 2016	Jeff Clarke	
Date/Location	Name	Signature

Important Note: EASA cannot accept applications without signature. Please make sure that you sign the application.

This Application should be sent by fax, e-mail or regular mail to:

European Aviation Safety Agency
Applications and Outsourcing Services Department
Postfach 10 12 53
D-50452 Köln
Germany

Fax: +49 – (0)221 - 89990 ext. 4458

E-mail: STC@easa.europa.eu

Completion Instructions

Completion
Instructions

Please double-click on the icon to
access the completion instructions

	TC	EASA
206 A	CAR 6	Same
B	amdt 61 thru 6-4	Same
L	6.307(b)+6.637 of 6-5	
L-1	SC 2/10/62	Same
	SFR SC B/L	✓
	Water Alcohol SC	✓

L-3 Same as above same
+ 27.1529 C 27-18

L-4 FAR 27 C Amdt 24 same
+ para

407 FAR 27 C Amdt 30 same
+ para



Completion Instructions for the Application for Approval of Supplemental Type Certificate

This Application Completion Instruction Sheet will provide you with any additional instructions and requirements necessary to complete the Application for Approval of Supplemental Type Certificate. It is strongly recommended to use the English language in completing the form. Please complete the form in a **clearly legible way**.

# - Field Name	Completion Instructions																				
1.1 Your Reference	Please provide a unique internal reference to this application. This reference will be used as an identifier of your application in all communication, e.g. invoice/s, acceptance letter, by EASA.																				
2.1.1 Name and Address	<p>Applicant Number: If known, please enter your EASA Applicant Number. This number follows the pattern 3XXXXX and can be found on any application acceptance letter received for previous applications. It is called either "Customer Number " or "Applicant Number" on the application acceptance letter.</p> <p>Please enter the full name of the company as it appears on the Business Registration or similar legal document stating name and seat of the company. If applicable also enter the Trade Name, Doing-business-as and the Company registration number. Please enter the address of the registered office as it appears on the Business Registration or similar legal document. First time applicants need to submit a copy of the company's Business Registration or similar legal document stating name and seat of the company together with the application. If applicable, an additional translation of this document (done by an authorised translator, signed and stamped) should be submitted.</p> <p>In case the applicant is not a company but a natural person, please enter the full name as it appears in the ID Card/Passport and enter the address of registry. A copy of the person's ID or passport needs to be provided with the first application.</p>																				
2.1.2 Contact Person	The name and contact details specified in this section are those of the person responsible for the application.																				
2.2.1 Billing Address	The (company) name and address specified in this section will be printed on the invoice/s EASA will issue. A (company) name deviating from the one entered in section 2.1.1 can only be accepted by EASA upon justified request. A written statement, signed and stamped, from the legal entity which is taking responsibility to pay the EASA F&C invoice(s) is to be submitted together with the application.																				
2.2.2 Contact Person	The name and contact details specified in this section are those of the person that will be contacted for all issue connected with the EASA invoice/s. (e.g. accounts payable clerk). Responsible for ensuring the EASA terms of payment are honoured. An electronic invoice copy will be issued to the email address indicated here.																				
2.3.1 Shipping Address	The (company) name and address specified in this section is where EASA will send the original certificate/approval.																				
2.3.2 Contact Person	The contact person of this section is the person the original certificate/approval will be sent to.																				
3. Identification of Activity	<p>Please indicate the classification of the STC.</p> <p>F&C Regulation - Part V - Explanatory Note (7)</p> <table border="1"> <thead> <tr> <th></th><th>Simple</th><th>Standard</th><th>Complex</th></tr> </thead> <tbody> <tr> <td>EASA Supplemental Type Certificate (STC)</td><td>STC, major design change, or repair, only involving current and well-proven justification methods, for which a complete set of data (description, compliance check-list and compliance documents) can be communicated at time of application,</td><td rowspan="3">All other STC, major design changes or repairs.</td><td rowspan="3">Significant (*) STC or major design change.</td></tr> <tr> <td>EASA major design changes</td><td>and for which the applicant has demonstrated experience,</td></tr> <tr> <td>EASA major repairs</td><td>and which can be assessed by the project certification manager alone, or with a limited involvement of a single discipline specialist.</td></tr> <tr> <td>Validated US Federal Aviation Administration (FAA) STC</td><td>Basic (**)</td><td>Non-basic</td><td>Significant non-basic</td></tr> <tr> <td>Validated FAA major design change</td><td>Level 2 (**) major design changes when not automatically accepted. (***)</td><td>Level 1 (**) </td><td>Significant level 1</td></tr> </tbody> </table>		Simple	Standard	Complex	EASA Supplemental Type Certificate (STC)	STC, major design change, or repair, only involving current and well-proven justification methods, for which a complete set of data (description, compliance check-list and compliance documents) can be communicated at time of application,	All other STC, major design changes or repairs.	Significant (*) STC or major design change.	EASA major design changes	and for which the applicant has demonstrated experience,	EASA major repairs	and which can be assessed by the project certification manager alone, or with a limited involvement of a single discipline specialist.	Validated US Federal Aviation Administration (FAA) STC	Basic (**)	Non-basic	Significant non-basic	Validated FAA major design change	Level 2 (**) major design changes when not automatically accepted. (***)	Level 1 (**)	Significant level 1
	Simple	Standard	Complex																		
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Validated FAA major design change	Level 2 (**) major design changes when not automatically accepted. (***)	Level 1 (**)	Significant level 1																		





Completion Instructions for the Application for Approval of Supplemental Type Certificate

	Validated FAA major repair	N/A (automatic acceptance)	Repairs on critical component (**)	N/A
	<p>(*) "Significant" is defined in paragraph 21.A.101 (b) of the Annex to Regulation (EU) No. 748/2012 (and similarly in FAA 14CFR 21.101 (b)).</p> <p>(**) For the definitions of "basic", "non-basic", "level 1", "level 2", "critical component" and "Certificating Authority", see the applicable bilateral agreement under which the validation takes place.</p> <p>(***) Automatic acceptance criteria by EASA for level 2 major changes are defined in the applicable bilateral agreement under which the validation takes place.</p>			
4.1 Fees and Charges Information	<p>The weight category shall refer to the maximum take-off weight (MTOW) of the aircraft type/model as specified in the type certificate data sheet.</p> <p>The MTOW of the initial Type Certificates and subsequently of the majority (more than 50%) of the related models covered by this Type Certificate determines the applicable MTOW category.</p> <p>High Performance Aircraft in the weight category up to 5 700 kg [12 500 lbs] are those aeroplanes having a Mmo greater than 0.6 and/ or a maximum operating altitude above 25 000 ft. They shall be charged as defined in the categories 'over 5 700 kg[12 500 lbs] up to 22 000 kg'.</p> <p>Large Rotorcraft refers to CS-29 and CS-27 cat A;</p> <p>Small Rotorcraft refers to CS-27 with Maximum Take Off Weight (MTOW) below 3 175 Kg and limited to 4 seats, including pilot;</p> <p>Medium Rotorcraft refers to other CS-27.</p> <p>Small Airships refer to</p> <ul style="list-style-type: none"> all Hot Air Airships independent of their size, Gas Airships up to a volume 2 000 m³; <p>Medium Airships refer to Gas Airships with a volume of</p> <ul style="list-style-type: none"> more than 2 000 m³ up to 15 000 m³; <p>Large Airships refer to Gas Airships with a volume of</p> <ul style="list-style-type: none"> more than 15 000 m³. <p>Changes/repairs on APU shall be regarded as changes/repairs to engines of the same power rating.</p>			
4.2 Applicability	Identify the Type Certificate Number, the Type Certificate Holder, the Type and Model(s) to which this application is applicable. If applicable, please also identify variant(s).			
4.3 Airworthiness Code	Identify the applicable airworthiness code proposed to be used for EASA certification.			
4.4 European Light Aircraft	ELA1	ELA2		
	ELA1 aircraft means the following manned European Light Aircraft:	ELA2 aircraft means the following manned European Light Aircraft:		
	an airplane with a Maximum Take-off Mass (MTOM) of 1 200 kg or less that is not classified as complex motor-powered aircraft	an airplane with a Maximum Take-off Mass (MTOM) of 2 000 kg or less that is not classified as complex motor-powered aircraft		
	a sailplane or powered sailplane of 1 200 kg MTOM or less	a sailplane or powered sailplane of 2 000 kg MTOM or less		
	a balloon with a maximum design lifting gas or hot air volume of <ul style="list-style-type: none"> not more than 3 400 m³ for hot air balloons 1 050 m³ for gas balloons 300 m³ for tethered gas balloons 	a balloon		
	an airship designed for not more than <ul style="list-style-type: none"> 4 occupants and <ul style="list-style-type: none"> a maximum design lifting gas or hot air volume of not more than 3 400 m³ for hot air airships and <ul style="list-style-type: none"> 1 000 m³ for gas airships 	a hot air airship a gas airship complying with all of the following characteristics: <ul style="list-style-type: none"> 3% maximum static heaviness Non-vector thrust (except reverse thrust) Conventional and simple design of: structure, control system and ballonet system Non-power assisted controls 		





Completion Instructions for the Application for Approval of Supplemental Type Certificate

a Very Light Rotorcraft

Please take note of Art. 21.A.101 (e) of Commission Regulation (EU) No. 748/2012 with regard to the expiry of your application.

5.1 EASA Approval N°	Identify the original EASA or grandfathered NAA approval number in case of a revision to an existing approval.	
5.2 Third Country Approval N°	Identify the original 3rd country approval number in case of a revision or validation of an existing approval.	
6.1 Title	Give a short title not exceeding 40 characters.	
6.2 Description	Give a brief description of the design change.	
6.3 Affected Areas	Identify all parts of the type design and the approved manuals affected by the change and the certification specifications and environmental protection requirements with which the change has been designed.	
6.4 Re-Investigations	If necessary, make reference to further attached documents, e.g. relating to Part 21, § 21.A.101 compliance.	
6.5 Justification	Identify any re-investigations necessary to show compliance of the changed with the applicable certification specification and environmental requirements; if necessary make reference to further attached documents.	
7. Part 21 demonstration of eligibility	Please choose the applicable way of demonstrating eligibility in accordance with Part 21 by ticking the relevant box. Reference can be made to ongoing projects for new (A)DOA or extending the scope of the (A)DOA. Applicants from countries not located in an EASA member state do not need to demonstrate eligibility via an (A)DOA or certification programme.	
	Certification Programme Demonstration of capability via a certification programme for:	AP DOA Demonstration of capability via AP DOA for:
	ELA1 aircraft	ELA2 aircraft
	Engine [to be] installed on ELA1 aircraft	Engine [to be] installed on ELA2 aircraft
	Propeller [to be] installed on ELA1 aircraft	Propeller [to be] installed on ELA2 aircraft
		Piston Engine
		Fixed or adjustable pitch propeller



ENGINEERING REPORT

ER952.02

**Qualification of Minor Design Changes for Production Improvements to
Cyclic Friction Installation iaw
DCL952-1, Revision 2, 17 November 2016
for
STC; SH12-59, Issue; 2, Approved; 30 November 2012, Issued; 13 February 2015
Aero Design Ltd.
Bell 206 A/B/L Series/407
Installation of Cyclic Stick Control Friction as a Direct Replacement for the Bell Cyclic
Knob and Shaft Assembly**

Design Change Summary

Document No. - Rev - Date, Title

PNs - Descriptions and

- Design Change Comments

95210-R2-07Sep2016, Cyclic Friction Assembly

See dwg for part & assembly PNs – Descriptions

- Updated assembly instructions for new assembly per dwg 95214

95212-R2-03Aug2016, Threaded Rod Assembly

See dwg for part & assembly PNs – Descriptions

- Add alternate brazing procedure for assembly

95214-R0-07Sep2016, Tube Assembly

See new dwg for part & assembly PNs – Descriptions

- New assembly to weld tube and retainer instead of press fit on final assembly.

NOTE

See section 2.0 CONFIGURATION CONTROL for record keeping details and 5.0 ADDITIONAL CHANGES.

Prepared by: Jeff Clarke, P.Tech.(Eng.) – Aero Design Ltd.

Revision 0, 17 November 2016

Aero Design Ltd.



9888A Malaspina Road, Powell River, BC, V8A 0G3

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2.0	CONFIGURATION CONTROL INFORMATION	3
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4.0	95214 TUBE ASSEMBLY INFORMATION	5
4.1	Discussion	5
4.2	Dissemination	5
5.0	ADDITIONAL CHANGES	6

1.0 DESIGN CHANGE SUMMARY

The production improvements do not change the form-fit-function to these improved parts therefore the new parts are interchangeable with the original parts.

The updated Threaded Rod Assembly adds an alternate brazing process in addition to the original welding process to retain the Stops in position on the Threaded Rod. The brazing process eliminates deflection in the threaded rod compared to welding, which leads to reduced time manually adjusting the threaded rods back to straight prior to assembly.

Threaded Rod Assembly Action Plan:

- Add brazing as an alternate process to retain the stops on the fabrication drawing
- Brazed Threaded Rod Assemblies are planned for the next production run.
- See section 3.0 95212 THREADED ROD ASSEMBLY INFORMATION for additional details.

The new Tube Assembly consists of a Tube with a Retainer Bushing welded in one end. The original configuration of the Cyclic Friction Assembly pressed these two components together in the process of assembling all of the components. It has been found there is too much variation in the inside diameters of the stock Tube material to ensure a press fit is achieved with the Retainer Bushing, especially in larger batches.

Tube Assembly Action Plan:

- Create new assembly consisting of Retainer Bushing welded to Tube.
- Existing Friction Assemblies are not affected as each has been checked for sufficient fits on assembly
- Updated welded Tube Assemblies are planned for the next production run.
- See section 4.0 95214 TUBE ASSEMBLY INFORMATION for additional details.

These changes have a negligible effect therefore this modification continues to comply with the certification basis for this approval.

2.0 CONFIGURATION CONTROL INFORMATION

The new Tube Assembly is on a new drawing and has been assigned a new part number. The Threaded Rod Assembly adds an optional fabrication process and retains the original part number. The Cyclic Friction Assembly incorporates these improved parts and retains the original part number.

Original PN	New/Replacement PN	Description
95210-01	N/A	Cyclic Friction Assembly
95212-01	N/A	Threaded Rod Assembly
N/A	95214-01	Tube Assembly

The fabrication drawings are controlled by DCL952-11 that is controlled by DCL952-1; the installation instructions are not changed, and are controlled by DCL952-1; and DCL952-1 is sited on STC SH12-59.

There is no parts breakdown for components of the Cyclic Friction Assembly in ICA952.90 as the Cyclic Friction Assembly cannot be repaired in the field, replacement is the only option if damage is found. There are no changes to ICA952.90; and ICA952.90 is also sited on STC SH12-59.

3.0 95212 THREADED ROD ASSEMBLY INFORMATION

3.1 Discussion

This updated configuration adds silver brazing as an option in place of welding. Brazing is a lower temperature operation, and the heat is applied over a larger area in order to allow the brazing alloy to flow into the joint, effectively eliminating deflection. The brazing alloy specified, AWS A5.8 BAg-24, is a silver based cadmium free product, intended for brazing of stainless steels.

Strength of the Threaded Rod Assembly is limited by the threaded rod itself, #10-32 stainless steel. Changing the tack weld to brazing does not reduce the strength of the rod. Weight change is negligible. New part numbers are not required because the new parts are interchangeable with the old parts.

The threaded rod assembly is used to draw the cyclic base closed around a ball at the bottom of the cyclic stick in order to apply friction to the ball, at a level selected by the pilot. The threaded rod assembly incorporates two stops to limit in-out travel of the rod and maintain alignment of the rod within the friction assembly, and the lower stop includes a flat to prevent rotation of the rod during tightening or loosening of the cam lever that applies the drawing action to the rod.

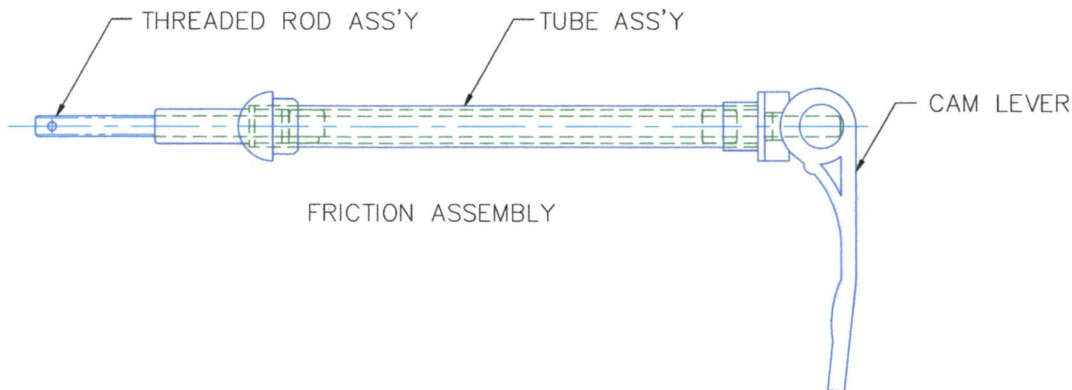


Figure 3.1.1 – Cyclic Friction Assembly – 95210

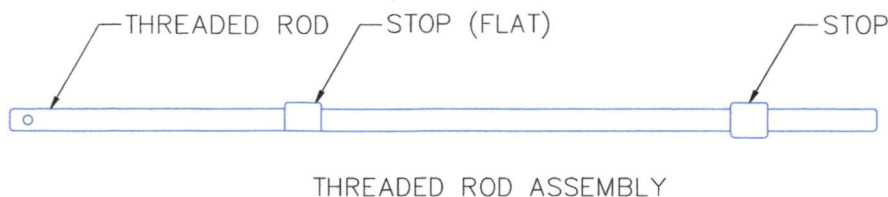


Figure 3.1.2 – Threaded Rod Assembly – 95212

The original configuration of the threaded rod assembly, on issue 1 of the STC, retained the stops by welding in a hole drilled into the stop. The heat required to fill the hole with weld caused the threaded rod to deflect significantly, so each rod had to be manually straightened to ensure correct operation of the friction assembly. The weld on the stop was changed on issue 2 of the STC to a small tack weld on the end of the stop, which does reduce deflection but not entirely so manual straightening is still required.

3.2 Dissemination

The updated configuration will be used for the next production run. No outside dissemination of the change is required.

4.0 95214 TUBE ASSEMBLY INFORMATION

4.1 Discussion

This update creates a new sub-assembly consisting of a 95220-01 Tube and a 95222-01 Retainer Bushing fuse welded together. This is in response to the variability found in the stock material used for the 95220-01 Tube, 3/8" x 0.035 round 304 stainless steel tube, particularly when large batches of mating components are produced by automated (CNC) machining methods. The original assembly of the 95210-01 Friction Assembly relied solely on press-fit of the components, but it has been found the variation in stock diameter of the tube can prevent a press-fit to be achieved when inserting the 95222-01 Retainer Bushing. The outside diameter tends to be oversize, which does not prevent press-fit assembly with the mating caps.

The update does not change the original dimensions of the Retainer Bushing, but instead adds a fuse weld when it is assembled with the Tube to ensure the Retainer Bushing cannot rotate if the fit is not sufficient to do so. The Retainer Bushing must not rotate as it prevents the Threaded Rod Assembly from rotating so the Cam Lever can be adjusted to apply the desired level of friction on the cyclic.

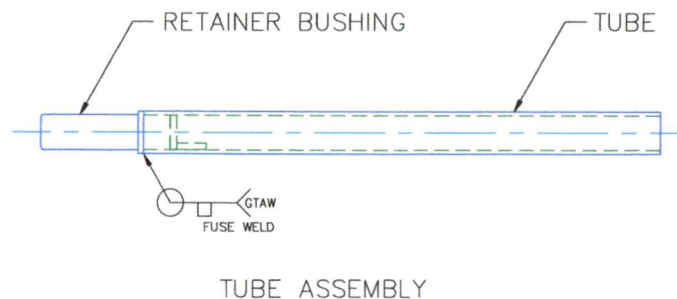


Figure 4.1.1 – Tube Assembly – 95214

A new part number is assigned to the assembly of the Tube and Retainer Bushing so parts can be identified in-process. A new part number for the Friction Assembly is not required because the new welded assembly is interchangeable with the original press-fit parts.

4.2 Dissemination

The updated configuration will be used for the next production run. No outside dissemination of the change is required.

5.0 ADDITIONAL CHANGES

The following additional minor changes have been made to the fabrication drawings noted:

1. 95210 Revision 2: incorporates the new part number for 95214-01 Tube Assembly and updates the assembly instructions accordingly.
2. 95226 Revision 2 and 95238 Revision 2: The anodizing finish is changed from MIL-A-8625F, Type III to Type II. Type III is an engineered hardcoat intended for improved wear resistance on sliding surfaces, which is not required in this application. Type II is the correct coating for this application as a corrosion preventative coating.



Jeff Clarke, Vice President
Aero Design Ltd.
9888A Malaspina Road, Powell River, BC, V8A 0G3
Tel: 604.483.2376, jeff@aerodesign.ca

23 November 2016

Cc: Michael.Chan@tc.gc.ca, OPI, Aircraft Certification, Vancouver Regional Office, TCCA

**Production Improvements wrt
STC SH12-59 Issue 2, Bell 206 Series & 407, Installation of Cyclic Stick Control Friction
Qualification of Minor Design Changes, Decision Record CP-SH12-59-1612-23Nov2016
(Transmittal Letter; TL1612-NC-23Nov2016 with original copies noted below)**

Dear Mr. Clarke,

Wings Engineering has supported Aero Design's CAR 521 Division VIII responsibilities for the minor production improvement changes to SH12-59 for the per attached decision record.

Included with this letter are the documents bearing the original Transport Canada signatures:

DCL952-1, Rev 2, 23 Nov 2016 Cyclic Friction Replacement, Installation

DCL952-11, Rev 2, 23 Nov 2016 Cyclic Friction Replacement, Fabrication

As discussed with your office, the current revision status of the approved/accepted documents cited on SH12-59 Issue 2 is as follows:

DCL952-1, Rev 2, 23 Nov 2016 (Updated as noted.)

FMS952.91, Rev 1, 6 Aug 2014 (No change.)

ICA952.90, Rev 1, 6 Aug 2014 (No change.)

The transfer of this approval in the name of another person requires the prior approval from the Minister in accordance with section 521.357 of the Canadian Aviation Regulations (CAR).

Embodiment of modifications requiring certification of detail part fabrication and installation, in accordance with approved data identified on the certificate, is considered to be a maintenance activity and the requirements of subsection 571.06(4) of the CARs will apply.

A Canadian Holder is required to fulfill the responsibilities of a Design Approval Document Holder in accordance with Division VIII of subpart 521 of the CAR, including the reporting of any service difficulties experienced with their product. Therefore, should you become aware of any defect, malfunction or failure resulting from the design change, it is your responsibility to submit a Service Difficulty Report to Transport Canada.

Thank you for the work.

Yours truly,

James Tinson PEng, FEC, DAR
President – Wings Engineering Limited



Department of Transport

Supplemental Type Certificate

This approval is issued to:

Aero Design Ltd.
9888A Malaspina Road
Powell River, British Columbia
Canada V8A 0G3

Number: SH12-59

Issue No.: 2

Approval Date: November 30, 2012

Issue Date: February 13, 2015

Responsible Office:

Prairie and Northern

Aircraft/Engine Type or Model:

Bell 206A, 206B, 206L, 206L-3, 206L-4, 407

Canadian Type Certificate or Equivalent:

H-92

Description of Type Design Change:

Installation of Cyclic Stick Control Friction as a Direct Replacement for the Bell Cyclic Knob and Shaft Assembly.

**Installation/Operating Data,
Required Equipment and Limitations:**

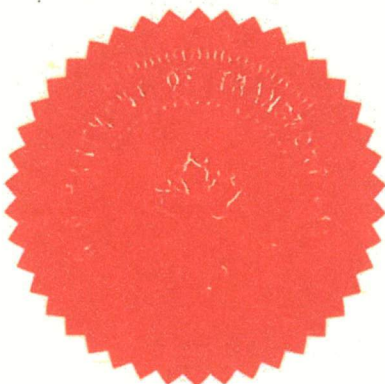
Installation of the Cyclic Stick Control Friction to be completed in accordance with Transport Canada approved, Aero Design Ltd. Document Control List DCL952-1 Revision 1, dated 7 August 2014 or later approved revision.

Transport Canada approved Aero Design Ltd. Flight Manual Supplement FMS952.91 Revision 1 dated 6 August 2014, or later approved revision, is required with this installation.

Transport Canada accepted Aero Design Ltd. Instruction for Continued Airworthiness ICA952.90 Revision 1, dated 9 January 2015, or later accepted revision is required with this installation.

Basis of certification: FAR Part 27 including amendments 27-1 through 27-30. (The Bell 407 basis of certification as defined in TCDS H-92).

— End —



Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated **will not** adversely affect the airworthiness of the modified product.

F.J.B. Wright
For Minister of Transport

DOCUMENT CONTROL LIST

(Listing of Current Approved and Accepted Documents)

DCL REV.	DOCUMENT NO.	DOC REV.	DOC REV. DATE	DOCUMENT CONTENT
APPROVAL DOCUMENT				
1	SH12-59	2	13/02/2015	TCCA STC Approval, approval date 30/11/2012
1	SR03283NY	1	15/09/2015	FAA STC Approval, approval date 05/06/2013
DOCUMENTS SITED ON THE APPROVAL DOCUMENT				
1	FMS952.91	1	06/08/2014	Attachment Provisions Installation
1	ICA952.90	1	09/01/2015	Instructions for Continued Airworthiness
INSTALLATION & INSTALLATION SUPPORT DOCUMENTS				
1	95201	1	31/12/2014	Cyclic Friction Replacement Installation
1	95202	0	31/12/2014	Cyclic Friction Replacement Installation (S/N 254-1657)
FABRICATION AND OTHER DOCUMENTS				
2	DCL952-11	2	23/11/2016	Document Control List for Cyclic Friction Replacement Fabrication

DCL REVISION CONTROL				
DCL REV.	DCL REV. DATE	REVISION BY	APPROVED BY	DESCRIPTION
0	28/11/2012	J. Clarke	TCCA - PNR	Original.
1	07/08/2014	J. Clarke	TCCA - PNR	DCL format updated, all documents updated for new address, added S/N 254-1657 configuration.
2	23/11/2016	J. Clarke	DAR 304	Format updated to note changes per DCL revision. Minor changes; See DCL952-11.

APPROVAL:



Aero Design Ltd.

9888A Malaspina Road
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Tel: 604.483.2376 www.aerodesign.ca

**Bell Helicopters 206A, 206B, 206L Series, 407
Cyclic Friction Replacement
Installation**

Document Control List Number

DCL952-1

Revision

2

Sheet

1 of 1

DOCUMENT CONTROL LIST

(The Current Approval/Configuration Control List for Fabricated Parts, Assemblies and Other Documents and a Complete Listing of the Applicable Design Compliance Documents)

DCL REV.	DOCUMENT NO.	DOC REV.	DOC REV. DATE	DOCUMENT CONTENT
FABRICATION AND ASSEMBLY DOCUMENTS				
2	95210	2	07/09/2016	Friction Assembly
2	95212	2	03/08/2016	Threaded Rod Assembly
2	95214	0	07/09/2016	Tube Assembly
1	95220	1	14/10/2013	Parts – Tube
1	95222	1	14/10/2013	Parts – Retainer Bushing
1	95224	1	21/03/2014	Parts – Cap
2	95226	2	08/09/2016	Parts – Crescent Bushing
1	95228	1	14/10/2013	Parts – Curved Washer
1	95230	1	04/10/2013	Parts – Barrel Nut
1	95232	1	14/10/2013	Parts – Threaded Rod
1	95234	1	14/10/2013	Parts – Stop
1	95236	1	14/10/2013	Parts – Stop
2	95238	2	08/09/2016	Parts – Curved Washer
1	95240	0	31/12/2014	Friction Assembly (S/N 254-1657)
1	95242	0	31/12/2014	Tube Assembly
1	95252	0	31/12/2014	Parts – Retainer Bushing
1	95254	0	31/12/2014	Parts – Cap

DCL REVISION CONTROL				
DCL REV.	DCL REV. DATE	REVISION BY	APPROVED BY	DESCRIPTION
0	28/11/2012	J. Clarke	TCCA - PNR	Original.
1	07/08/2014	J. Clarke	TCCA - PNR	DCL format updated, all documents updated for new address, added S/N 254-1657 configuration.
2	23/11/2016	J. Clarke	DAR 304	Format updated to note changes per DCL revision. Minor changes; Threaded Rod Assy w/brazing option and welded Tube Assy added.

APPROVAL:



Aero Design Ltd.

9888A Malaspina Road
Powell River, BC, Canada, V8A 0G3
Tel: 604.483.2376 www.aerodesign.ca

**Bell Helicopters 206A, 206B, 206L Series, 407
Cyclic Friction Replacement
Fabrication**

Document Control List Number

DCL952-11

Revision

2

Sheet

1 of 2

DOCUMENT CONTROL LIST

[illegible]

Document Control List Number	Revision	Sheet
DCL952-11	2	2 of 2

Part E – Post Certification – Minor Design Change Classification Decision Record

Approval No., Issue, Date: SH12-59, Issue 2, Approved: 30 Nov 2012, Issued: 13 Feb 2015
Aero Design, Bell 206A, B, L, L-3, L-4 & 407, Cyclic Stick Control Friction Assy

Title/Description of Design Change: Production Improvements:
Brazing option for Threaded Rod Assy and a new welded Tube
Assembly replacement for a two-piece pressed assembly.

Change Document No.: Aero Design DCL952-1 & 11 Rev/Date: 2 / 23 Nov 2016 (Both DCLs)

Application Notes:

For each item listed it shall be determined whether the change to be accomplished could have other than a negligible effect on; weight and centre-of-gravity limits, structural strength, performance, power plant operation, flight characteristics or other qualities affecting its airworthiness or environmental characteristics.

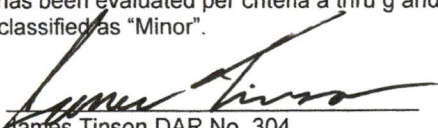
The following questions are answered with either a YES or NO response.

A YES answer to any individual question indicates that the design change shall be classified major.

Criteria per CAR Standard 571, Appendix A, 2002/06/01	Initial for NO
(a) Operating Limitations	
(1) Does the modification or repair involve a revision in the operating limitations specified in the approved type design?	<i>[Signature]</i>
(b) Structural Strength	
Information Note: The questions contained in this paragraph shall be applied to alterations of an airframe, engine, propeller, or component.	
Does the modification or repair alter:	
(1) a principal component of the aircraft structure such as a frame, stringer, rib, spar, skin or rotor blade?	<i>[Signature]</i>
(2) a life-limited part or a structural element that is subject to a damage tolerance assessment or fail-safe evaluation?	<i>[Signature]</i>
(3) the strength or structural stiffness of a pressure vessel?	<i>[Signature]</i>
(4) the mass distribution in a structural element?	<i>[Signature]</i>
Information Note: This might involve the installation of an item of mass that would necessitate a structural re-evaluation.	
(5) a containment or restraint system intended for occupants or the storage of items of mass (e.g. cargo)?	<i>[Signature]</i>
(6) the structure of seats, harnesses, or their means of attachment?	<i>[Signature]</i>
(c) Powerplant Operation	
Does the modification or repair:	
(1) affect the power output or control qualities of the powerplant, engine, propeller, or their accessories?	<i>[Signature]</i>
(2) alter the approved operating limitations?	<i>[Signature]</i>
(d) Performance and Flight Characteristics	
Does the modification or repair involve alterations that:	
(1) significantly increase drag or exceed aerodynamic smoothness limits?	<i>[Signature]</i>
(2) significantly alter thrust or power output?	<i>[Signature]</i>
(3) affect stability or controllability?	<i>[Signature]</i>
(4) induce flutter or vibration?	<i>[Signature]</i>
(5) affect the stall characteristics?	<i>[Signature]</i>

Criteria per CAR Standard 571, Appendix A, 2002/06/01 continued	Initial for NO
(e) Other Qualities Affecting Airworthiness Does the modification or repair:	
(1) change the information on, or the location of, a placard required by the type design or an Airworthiness Directive?	
(2) alter any information contained in the approved section of the aircraft flight manual or equivalent publication?	
(3) affect the flight-crew's visibility or their ability to control the aircraft?	
(4) affect egress from the aircraft?	
(5) reduce the storage capacity of an oxygen system, or alter the oxygen rate of flow?	
(6) affect flight controls or an autopilot?	
(7) alter an electrical generation device, or the electrical distribution system between the generating source and either its primary distribution bus, or any other bus designated as an essential bus? <i>Information Note: The electrical distribution system includes its associated control devices, and all its protection devices.</i>	
(8) reduce the storage capacity of the primary battery?	
(9) affect a communication system required by the approved type design?	
(10) affect instruments, or indicators that are installed as part of a system required by the approved type design?	
(f) Other Qualities Affecting Environmental Characteristics	
(1) Does the modification or repair increase aircraft noise levels or emissions?	

Criteria per AC 521-004, Issue 01, 5.6 (2) (b) (iv)	Initial for NO												
(g) Consideration for the cumulative effect of minor changes. Review of all documents listed on the updated DCL, installation instructions, fabrication drawings, ECOs, etc and the documents listed below:													
<table border="0"> <tr> <td>Doc No.</td> <td>Rev/Date</td> <td>Title/Other</td> </tr> <tr> <td>ER952.02</td> <td>0 / 17Nov2016</td> <td>Qualification of Minor Changes for Production Improvements</td> </tr> <tr> <td>_____</td> <td>_____</td> <td>_____</td> </tr> <tr> <td>_____</td> <td>_____</td> <td>_____</td> </tr> </table>	Doc No.	Rev/Date	Title/Other	ER952.02	0 / 17Nov2016	Qualification of Minor Changes for Production Improvements	_____	_____	_____	_____	_____	_____	
Doc No.	Rev/Date	Title/Other											
ER952.02	0 / 17Nov2016	Qualification of Minor Changes for Production Improvements											
_____	_____	_____											
_____	_____	_____											
(1) Is the cumulative effect of this design change major?													

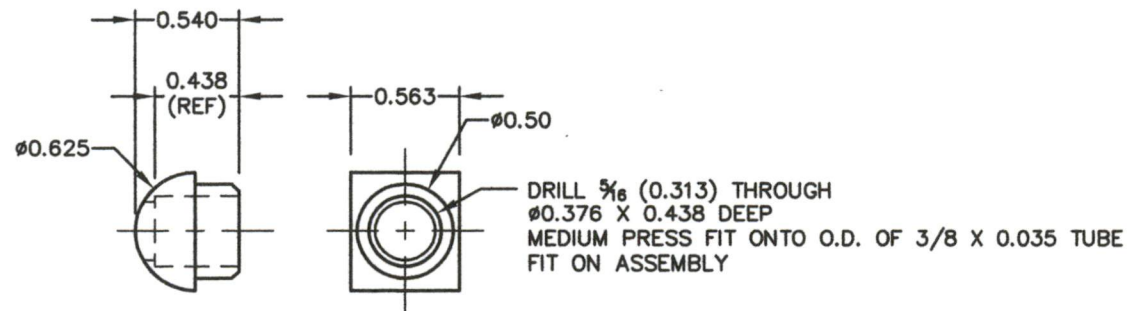
The design change noted has been evaluated per criteria a thru g and in accordance with approved EPM procedures and has been classified as "Minor".	
By:  James Tinson DAR No. 304	Date: 23 November 2016

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REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		
1	TITLE BLOCK UPDATED; FINISH NOTE ADDED	BJC	14/10/2013
2	ANODIZING CHANGED FROM TYPE III TO TYPE II	BJC	08/09/2016

NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.
2. ANODIZE ALL ALUMINUM PARTS IN ACCORDANCE WITH MIL-A-8625F, TYPE II.



01 CRESCENT BUSHING

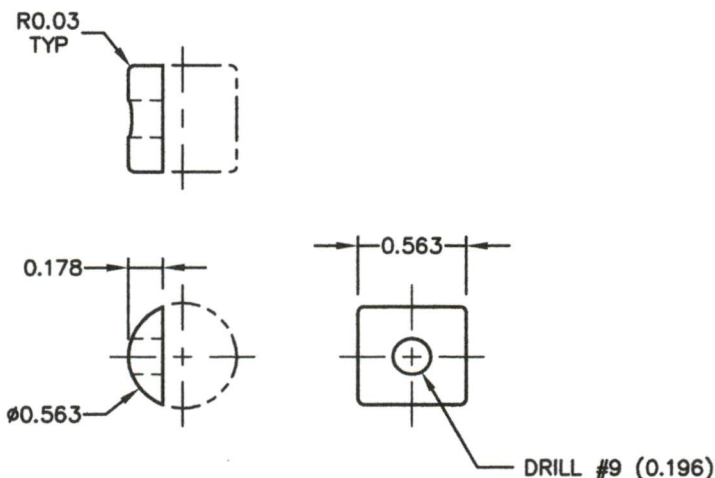
	95226-01	01	CRESCENT BUSHING	6061-T6 ALUMINUM	QQ-A-200/B	$\varnothing 0.75$ ROD
01	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE
QTY	LIST OF MATERIALS					
				APPROVALS	DATE	 AERO DESIGN LTD. 9888A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G3 TEL: 604.483.2376 www.aerodesign.ca
				DRAWN: JEFF CLARKE	18 OCT 2012	
				CHECKED: E. BURGAIN	18 OCT 2012	
				UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ± 0.010 $\pm 1/2^\circ$ X.XX ± 0.03 X.X ± 0.1		BELL 206B, 206L SERIES, 407 CYCLIC FRICTION REPLACEMENT PARTS - CRESCENT BUSHING
				SCALE 1 : 1	DWG. SIZE	DWG. NO.
				SHEET 1 OF 1	A4	95226
						REV. 2

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REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		
1	TITLE BLOCK UPDATED; FINISH NOTE ADDED	BJC	14/10/2013
2	ANODIZING CHANGED FROM TYPE III TO TYPE II	BJC	08/09/2016

NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.
2. ANODIZE ALL ALUMINUM PARTS IN ACCORDANCE WITH MIL-A-8625F, TYPE II.



01 CURVED WASHER

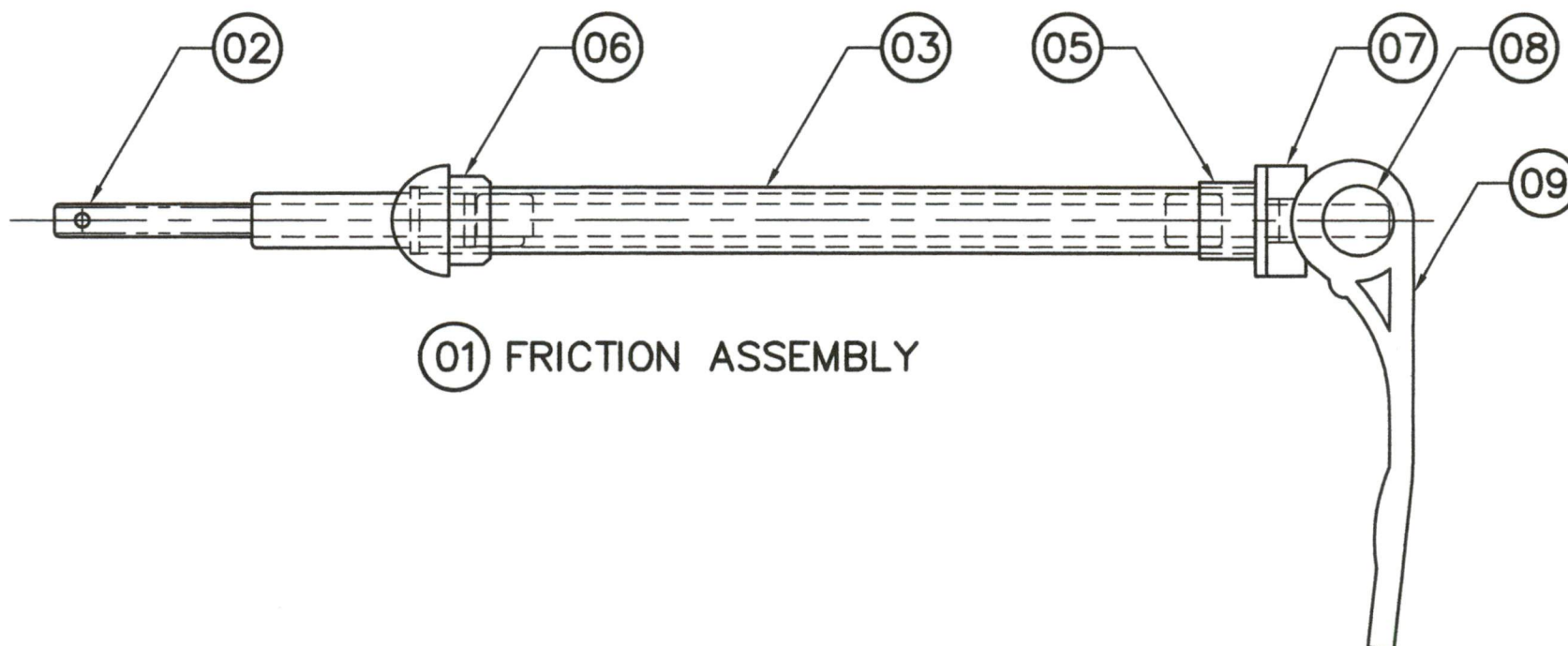
	95238-01	01	CURVED WASHER	6061-T6 ALUMINUM	QQ-A-200/8	Ø0.625 ROD
01	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE
QTY	LIST OF MATERIALS					
				APPROVALS	DATE	 AERO DESIGN LTD. 9888A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G3 TEL: 604.483.8376 www.aerodesign.ca
				DRAWN: JEFF CLARKE	18 OCT 2012	
				CHECKED: E. BURGAIN	18 OCT 2012	
				UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1		BELL 206B, 206L SERIES, 407 CYCLIC FRICTION REPLACEMENT PARTS - CURVED WASHER
				SCALE 1 : 1	DWG. SIZE	DWG. NO.
				SHEET 1 OF 1	A4	95238
						REV. 2

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REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		
1	TITLE BLOCK UPDATED; NOTE 1 CORRECTED.	BJC	14/10/2013
2	ASSEMBLY COMPONENTS UPDATED	BJC	07/09/2016

NOTES

1. INSERT THREADED ROD ASSEMBLY (02) INTO TUBE ASSEMBLY (03), ENSURING FLAT SIDE OF STOP ON THREADED ROD IS SEATED ON TAB INSIDE TUBE, PRESS CAP (05) ONTO TUBE ASSEMBLY, THEN PRESS TUBE ASSEMBLY (02, 03, 05) INTO CRESCENT BUSHING (06).
2. SLIDE CURVED WASHER (07) OVER THREADED ROD, INSERT BARREL NUT (08) INTO CAM LEVER (09), THEN THREAD CAM LEVER ONTO THREADED ROD. DO NOT TIGHTEN.



1	MODEL 1100	09	CAM LEVER (HYGOAL)
1	95230-01	08	BARREL NUT
1	95228-01	07	CURVED WASHER
1	95226-01	06	CRESCENT BUSHING
1	95224-01	05	CAP
1	--	04	--
1	95214-01	03	TUBE ASSEMBLY
1	95212-01	02	THREADED ROD ASSEMBLY
1	95210-01	01	FRICTION ASSEMBLY
QTY	PART NO.	ITEM	DESCRIPTION
LIST OF MATERIALS			

APPROVALS	DATE
DRAWN: JEFF CLARKE	18 OCT 2012
CHECKED: E. BURGAIN	18 OCT 2012

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES.
TOLERANCES ON:
DECIMALS ANGLES
X.XXX ± 0.010 $\pm 1/2^\circ$
X.XX ± 0.03
X.X ± 0.1



AERO DESIGN LTD.

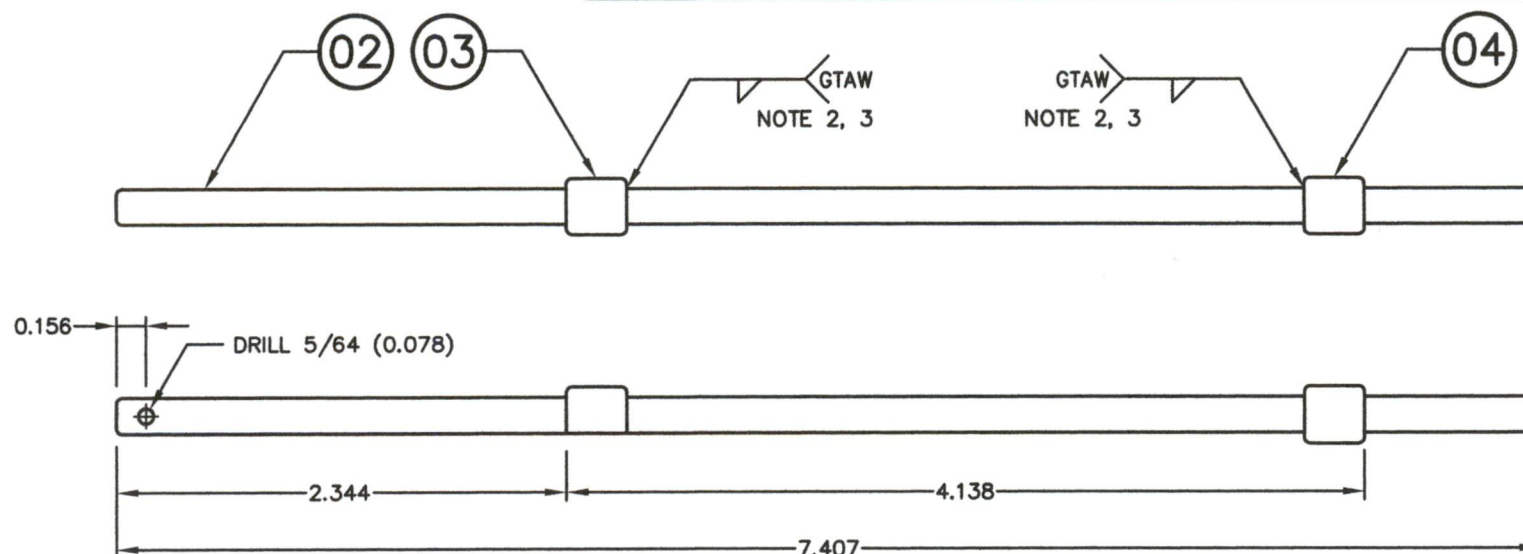
9888A MALASPINA ROAD
POWELL RIVER, BC, CANADA, V8A 0G3
TEL: 604.483.2376 www.aerodesign.ca

BELL 206B, 206L SERIES, 407
CYCLIC FRICTION REPLACEMENT
FRICTION ASSEMBLY

SCALE 1 : 1	DWG. SIZE	DWG. NO.	REV.
SHEET 1 OF 1	A4	95210	2

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REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		
1	TITLE BLOCK UPDATED; STOP SPACING CHANGED; WELD CHANGED	BJC	14/10/2013
2	ALTERNATE BRAZING ADDED	BJC	03/08/2016



01 THREADED ROD ASSEMBLY

NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.
2. WELDING OF 304 STAINLESS STEEL TO BE COMPLETED BY GTAW METHOD TO AMS2685C. WELDING ROD SHALL CONFORM TO ER308L OR EQUIVALENT.
3. ALTERNATE: JOINTS MAY BE SILVER BRAZED IN ACCORDANCE WITH AC43.13-1B, SECTION 4-77 (2) USING AWS A5.8 BA_g-24 SILVER BRAZING ALLOY OR EQUIVALENT, AND AWS A5.31 FB3C FLUX OR EQUIVALENT. APPLY FLUX TO PARTS AND BRAZING ALLOY.

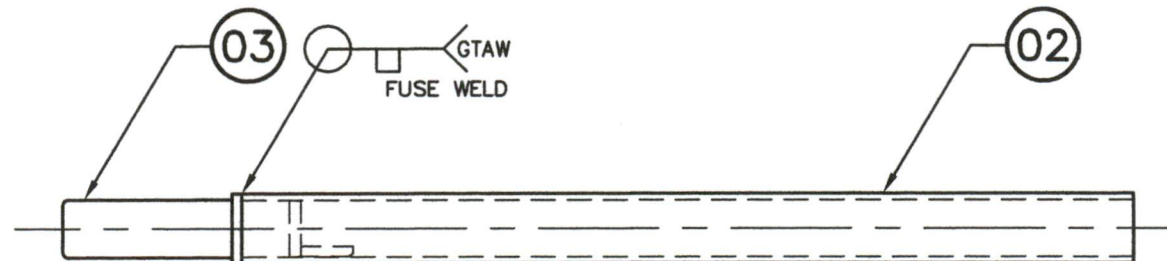
				APPROVALS		DATE		<div>AERO DESIGN LTD. 9888A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G3 TEL: 604.483.2376www.aerodesign.ca</div>					
				DRAWN: JEFF CLARKE		18 OCT 2012							
				CHECKED: E. BURGOIN		18 OCT 2012							
1	95236-01	04	STOP	UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1				BELL 206A, 206B, 206L SERIES, 407 CYCLIC FRICTION REPLACEMENT THREADED ROD ASSEMBLY					
1	95234-01	03	STOP										
1	95232-01	02	THREADED ROD										
	95212-01	01	THREADED ROD ASSEMBLY										
01	PART NO.	ITEM	DESCRIPTION					SCALE 1 : 1		DWG. SIZE	DWG. NO.	REV.	
QTY	LIST OF MATERIALS							SHEET 1 OF 1		A4	95212	2	

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REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		


NOTES

1. PRESS RETAINER BUSHING (03) INTO TUBE (02). WELD IN PLACE PER NOTE 2.
2. WELDING OF 304 STAINLESS STEEL TO BE COMPLETED BY GTAW METHOD TO AMS2685C.
WELDING ROD SHALL CONFORM TO ER308L OR EQUIVALENT.



(01) TUBE ASSEMBLY

1	95222-01	03	RETAINER BUSHING
1	95220-01	02	TUBE
	95214-01	01	TUBE ASSEMBLY
QTY	PART NO.	ITEM	DESCRIPTION
			LIST OF MATERIALS

APPROVALS	DATE	 AERO DESIGN LTD. 9888A MALASPINA ROAD POWELL RIVER, BC, CANADA, V8A 0G8 TEL: 604.483.8376 www.aerodesign.ca			
DRAWN: JEFF CLARKE	07 SEPT 2016				
CHECKED: JASON REKVE	07 SEPT 2016				
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2° X.XX ±0.03 X.X ±0.1		BELL 206B, 206L SERIES, 407 CYCLIC FRICTION REPLACEMENT FRICTION ASSEMBLY			
SCALE 1 : 1		DWG. SIZE	DWG. NO.	REV.	
SHEET 1 OF 1		A4	95214	0	

CF UPDATE

MINOR CHANGE REPORT

MCR95230-1

BELL 206B / 206L / 407 CYCLIC FRICTION REPLACEMENT

Material change for threaded bushing 95230-01

Subsequently approved on STC
Jose Rahn

Prepared by: Jeff Clarke, CET

Revision 0, 04 October 2013

Aero Design Ltd.



9888A Malaspina Road, Powell River, BC, V8A 0G3

Phone: 604-483-2376

Fax: 604-483-2372

www.aerodesign.ca

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1.0 INTRODUCTION

The cyclic friction is used to provide friction on the pilot cyclic stick, which is set to personal preference. The replacement is used to replace the original parts supplied by Bell Helicopters with parts that last longer and or more effective than the original.

A number of operators have expressed concern over the nylon material used for bushing 95203-01. The bushing was tested prior to approval with forces expected to be much higher than would be applied in use and the threads in the nylon were not found to deform, pull out, or otherwise be damaged from these higher loads.

The purpose for making the bushing out of nylon was to provide some "drag" on the threads, so when the friction handle is unlocked the handle does not rotate under its own weight.

To alleviate these concerns, and maintain some drag on the threads, the material is to be changed to brass with a self locking helicoil thread insert.

2.0 MANUFACTURING REVIEW BOARD ATTENDEES

The following individuals from the Manufacturing Review Board were included in this review:

Jason Rekve – PRM

Jeff Clarke – Quality Assurance Manager, Engineering Technologist

3.0 DETAILS OF MINOR CHANGE

3.1 Affected Parts / Assemblies

Original drawing: 95230, Revision 0

Part number: 95230-01

Description: Threaded Bushing

3.2 Description of Change

1. The material is changed from nylon (commercial specification Nylon 101 PA55) to brass (ASTM B16, alloy 360)
2. The thread is changed to accommodate a #10-32 helicoil, with a lip at the bottom to prevent the helicoil from being driven through.
3. Install 3591-3CN190 helicoil in to bushing

4.0 ASSESSMENT

4.1 Impact Assessment

All sections must be answered with a yes or no.

Assessment Criteria	Y/N
(a) Operating Limitations	
Does the change involve or require a revision in the operating limitations specified in the approved type design?	No
(b) Structural Strength	
Does the change alter:	
(1) a principal component of the aircraft structure such as a frame, stringer, rib, spar, skin or rotor blade?	No
(2) a life-limited part or a structural element that is subject to a damage tolerance assessment or fail-safe evaluation?	No
(3) the strength or structural stiffness of a pressure vessel?	No
(4) the mass distribution in a structural element?	No
(5) a containment or restraint system intended for occupants or the storage of items of mass (e.g. cargo)?	No
(6) the structure of seats, harnesses, or their means of attachment?	No
(c) Powerplant Operation	
Does the change:	
(1) affect the power output or control qualities of the powerplant, engine, propeller, or their accessories?	No
(2) alter the approved operating limitations?	No
(d) Performance and Flight Characteristics	
Does the change involve alterations that:	
(1) significantly increase drag or exceed aerodynamic smoothness limits?	No
(2) significantly alter thrust or power output?	No
(3) affect stability or controllability?	No
(4) induce flutter or vibration?	No
(5) affect the stall characteristics?	No
(e) Other Qualities Affecting Airworthiness	
Does the change:	
(1) change the information on, or the location of, a placard required by the type design or an Airworthiness Directive?	No
(2) alter any information contained in the approved section of the aircraft flight manual or equivalent publication?	No
(3) affect the flight-crew's visibility or their ability to control the aircraft?	No
(4) affect egress from the aircraft?	No
(5) reduce the storage capacity of an oxygen system, or alter the oxygen rate of flow?	No
(6) affect flight controls or an autopilot?	No
(7) alter an electrical generation device, or the electrical distribution system between the generating source and either its primary distribution bus, or any other bus designated as an essential bus?	No
(8) reduce the storage capacity of the primary battery?	No
(9) affect a communication system required by the approved type design?	No
(10) affect instruments, or indicators that are installed as part of a system required by the approved type design?	No
(f) Other Qualities Affecting Environmental Characteristics	
Does the change increase aircraft noise levels or emissions?	No

5.0 CERTIFICATION BASIS

Aircraft: Bell 260B, 206L series, 407 – TCDS H-92

Modification: Compliance Program CP952, Revision 1

Certification Basis: FAR Part 27, dated 2 October 1964, including amendments 27-1 through 27-30 except as noted on TCDS H-92.

This change remains in compliance with the basis of certification established for the modification.

6.0 JUSTIFICATION

This modification is considered minor in accordance with CAR 521.154 for the following reasons:

1. The change has been assessed in accordance with the definition of major modification in accordance with CAR 571, and found to be an other than major modification, see section 4.0.
2. The material change increases the strength of the threads over the original approved part.
3. The self-locking helicoil maintains the reason for using nylon in the first place.

7.0 IMPLEMENTATION

7.1 Short Term


1. New parts may be fabricated in accordance with revised drawing 95230, Revision 1, until such time as the approval documents can be revised (see long term). This report may be referenced as justification.

For the reasons listed in section 6.0

Approved:  Aug 2/13
Person Responsible for Manufacturing Date

7.2 Long Term

1. Revise document control list DCL952 to include drawing 95230, Revision 1. Include on approval at next re-issue.

Approved:  Aug 2/13
Person Responsible for Manufacturing Date

8.0 DOCUMENT CONTROL

The following documents have been included with or attached to the original job file (initial):

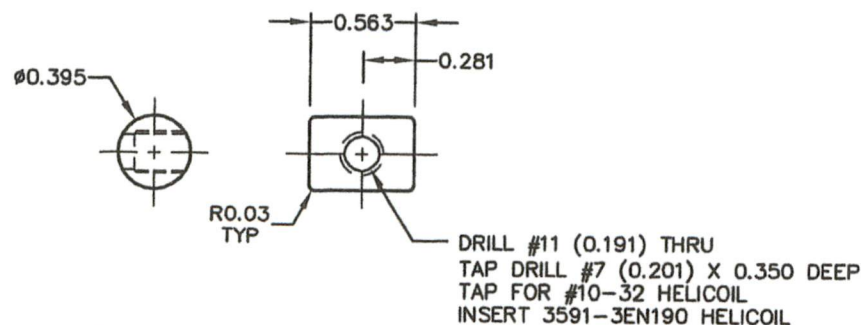
	Electronic	Hardcopy
This report	<input checked="" type="checkbox"/> by: <u>JK</u>	<input checked="" type="checkbox"/> by: <u>JK</u>
Drawing 95230, Revision 1	<input checked="" type="checkbox"/> by: <u>JK</u>	<input checked="" type="checkbox"/> by: <u>JK</u>

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REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE		
1	UPDATE TITLE BLOCK; CHANGE MATERIAL TO BRASS; ADD HELICOIL	BJC	04/10/2013

NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.



01 BARREL NUT

1	3591-3EN190	02	SELF-LOCKING HELICOIL	NITRONIC		
	95230-01-R1	01	BARREL NUT	BRASS - ALLOY 360	ASTM B16	$\phi 0.5$ ROD
QTY	PART NO.	ITEM	DESCRIPTION	MATERIAL	MATERIAL SPEC	STOCK SIZE

LIST OF MATERIALS

APPROVALS	DATE
DRAWN: JEFF CLARKE	18 OCT 2012
CHECKED: E. BURGON	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES.
TOLERANCES ON:
DECIMALS ANGLES
X.XXX ± 0.010 $\pm 1/2^\circ$
X.XX ± 0.03
X.X ± 0.1



AERO DESIGN LTD.

9888A MALASPINA ROAD
POWELL RIVER, BC, CANADA, V8A 0G3
TEL: 604.483.2376 www.aerodesign.ca

BELL 206A, 206B, 206L SERIES, 407
CYCLIC FRICTION REPLACEMENT
PARTS - BARREL NUT

SCALE	DWG. SIZE	DWG. NO.	REV.
1 : 1	A4	95230	1

SHEET 1 OF 1

Transports
Canada

Edmonton Operations Division, Aircraft Certification
1100, 9700 Jasper Avenue, NW
EDMONTON AB T5J 4E6

#31

Transports Canada
1100, 9700 Jasper Avenue
Canada Place
Edmonton AB T5J 4E6



PB031 1924061
003854 MD21U
1112 142050



01.65

T5J 4C8 2015.11.12

Attn.: Mr. Jeff Clarke
Aero Design Ltd.
9888A Malaspina Road
POWELL RIVER BC CANADA V8Z 0G3

Canada

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United States of America
Department of Transportation
Federal Aviation Administration

Supplemental Type Certificate

IMPORT

Number: SR03283NY

This certificate issued to: Aero Design Ltd.
9888A Malaspina Road
Powell River, British Columbia V8A 0G3
Canada

certifies that the change in the type design for the following product with the limitations and conditions therefore as specified hereon meets the airworthiness requirements of Part 6/27 of the Civil Air/Federal Aviation Regulations.

Original Product – Type Certificate Number:
H2SW

Make: Bell Helicopter Textron Canada Limited
Model: 206A, 206B, 206L, 206L-1, 206L-3, 206L-4, 407

Description of Type Design Change:

1. Installation of Cyclic Stick Control Friction as a direct replacement for Bell Cyclic Knob and Shaft Assembly in accordance with Installation Data listed in Aero Design Ltd. Document Control List DCL952-1 Revision 1, dated August 7, 2014, Transport Canada approved February 15, 2015, or later Transport Canada approved revision.
2. Aero Design Ltd. Rotorcraft Flight Manual Supplement FMS952.91 Revision 1, dated August 6, 2014, Transport Canada approved February 15, 2015, or later Transport Canada approved revision, is required with this installation.
3. Aero Design Ltd. Instructions for Continued Airworthiness ICA 952.90 Revision 1, dated January 9, 2015, Transport Canada accepted February 13, 2015, or later Transport Canada accepted revision, is required with this installation.

Limitations and Conditions:

1. The installer must determine whether this design change is compatible with previously approved modifications.
2. If the holder agrees to permit another person to use this certificate to alter the product, the holder shall give the other person written evidence of that permission.

This certificate and the supporting data which is the basis for approval shall remain in effect until surrendered, suspended, and revoked or a termination date is otherwise established by the Administrator of the Federal Aviation Administration.

Date of Application: December 12, 2012

Date Reissued: April 13, 2015

Date of Issuance: June 5, 2013

Date Amended: September 15, 2015

By Direction of the Administrator

Signature

Title

Gaetano Sciortino
Manager, New York
Aircraft Certification Office

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both. This certificate may be transferred or made available to third persons by licensing agreements in accordance with 14 CFR 21.47. Possession of this Supplemental Type Certificate (STC) document by persons other than the STC holder does not constitute rights to the design data nor to alter an aircraft, aircraft engine, or propeller. The STC's supporting documentation (drawings, instructions, specifications, flight manual supplements, etc.) is the property of the STC holder. An STC holder who allows a person to use the STC to alter an aircraft, aircraft engine, or propeller must provide that person with written permission acceptable to the FAA. (Ref. 14 CFR 21.120).



United States of America
Department of Transportation
Federal Aviation Administration
Supplemental Type Certificate

INSTRUCTIONS: The transfer endorsement below may be used to notify the appropriate FAA Aircraft Certification Office of the transfer of this Supplemental Type Certificate. The FAA will reissue the certificate in the name of the transferee and forward it to him.

Transfer Endorsement

Transfer the ownership of Supplemental Type Certificate Number: SR03283NY

To (Name and address of transferee)

From (Name and address of grantor)

Extent of Authority (if licensing agreement):

Date of transfer:

Signature of grantor: _____

Any alteration of this certificate is punishable by a fine of not exceeding \$1,000, or imprisonment not exceeding 3 years, or both. This certificate may be transferred or made available to third persons by licensing agreements in accordance with 14 CFR 21.47. Possession of this Supplemental Type Certificate (STC) document by persons other than the STC holder does not constitute rights to the design data nor to alter an aircraft, aircraft engine, or propeller. The STC's supporting documentation (drawings, instructions, specifications, flight manual supplements, etc.) is the property of the STC holder. An STC holder who allows a person to use the STC to alter an aircraft, aircraft engine, or propeller must provide that person with written permission acceptable to the FAA. (Ref. 14 CFR 21.120).

NEW ENGLAND REGION
NEW YORK AIRCRAFT CERTIFICATION OFFICE
1600 STEWART AVENUE, SUITE 410
WESTBURY, NEW YORK 11590

**INFORMATION CONCERNING YOUR RESPONSIBILITY AS HOLDER OF A
SUPPLEMENTAL TYPE CERTIFICATE ISSUED TO A CANADIAN APPLICANT**

This STC is official indications of FAA approval of your installation and may be used to authorize identical installation on other aircraft of the same model, subject to the limitation noted in the STC. It may be transferred, or otherwise made available to another party by means of a licensee arrangement; however, you are requested to advise this office when you transfer or grant licensee rights to the STC in order that we may take the necessary recording or reissuance action.

If you plan to manufacture and sell parts for installation on type certificated aircraft, please review FAR 21.502, which is applicable to parts imported into the U.S.

A copy of the STC and required documents should accompany each kit and installation. Also, your attention is directed to the limitations and conditions specified in the STC.

As recipient of this approval, except as provided in FAR21.3(d), you are required to report any failure, malfunction, or defect in any product or part manufactured by you that you have determined has resulted or could result in any of the occurrences listed in FAR 21.3(c).

The report should be communicated initially by telephone and subsequently in writing to the Manager, New York Aircraft Certification Office, telephone (516) 228-7300, mailing address: 1600 Stewart Avenue, Suite 410, Westbury, New York 11590. This first contact should take place within 24 hours after it has been determined that the failure required to be reported has occurred.

FAA Form 8010-4, Malfunction or Defect Report, or any other appropriate format is acceptable in transmitting the required details.

A handwritten signature in dark ink, appearing to read 'Gaetano Sciortino', with a large, sweeping flourish extending to the right.

Gaetano Sciortino
Manager
New York Aircraft Certification Office



Transport
Canada

Transports
Canada

1100, 9700 Jasper Avenue, N.W.
Edmonton AB T5J 4E6
www.tc.gc.ca

Your file Votre référence

Our file Notre référence

Thursday, November 12, 2015

C-15-0516
SH12-59, Issue #2
SR03283NY

Aero Design Ltd.
9888A Malaspina Road
Powell River, B.C.
V8A 0G3

SUBJECT:	Approval of	Installation of Cyclic Stick Control Friction as a Direct Replacement for Bell Cyclic Knob and Shaft Assembly.
	FAA STC:	SR03283NY
	Aircraft:	Bell 206A, 206B, 206L, 206L-1, 206L-3, 206L-4, 407
	FAA STC Holder:	Aero Design Ltd.

Enclosed is the original FAA Supplemental Type Certificate SR03283NY amended 15 September 2015, and information concerning your responsibility as a holder of a Supplemental Type Certificate issued to a Canadian Applicant.

Yours truly,

Certification Technologist
Engineering
Prairie and Northern Region
Phone: 780-495-5227
E-Mail: Jack.Staal@tc.gc.ca

Encl.

Transport Canada Transports Canada

FROM: ROUTING SYMBOL
DE: SYMBOLE D'ACHEMINEMENT _____

**EDMONTON OPERATIONS DIVISION
ENGINEERING
1100, 9700 JASPER AVENUE, NW
EDMONTON AB T5J 4E6 #31**

**Transport Canada
1100 - 9700 Jasper Avenue
Canada Place
Edmonton AB T5J 4E6**



PB031 1924061
003383 0ML21
0309 140130



**Attn.: Mr. Jeff Clarke
Aero Design Ltd.
9888A Malaspina Road
POWELL RIVER BC CANADA V8Z 0G3**

Canada

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TOUTE CORRESPONDANCE



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Department of Transport

Supplemental Type Certificate

This approval is issued to:

Aero Design Ltd.
9888A Malaspina Road
Powell River, British Columbia
Canada V8A 0G3

Number: SH12-59

Issue No.: 2

Approval Date: November 30, 2012

Issue Date: February 13, 2015

Responsible Office:

Prairie and Northern

Aircraft/Engine Type or Model:

Bell 206A, 206B, 206L, 206L-3, 206L-4, 407

Canadian Type Certificate or Equivalent:

H-92

Description of Type Design Change:

Installation of Cyclic Stick Control Friction as a Direct Replacement for the Bell Cyclic Knob and Shaft Assembly.

**Installation/Operating Data,
Required Equipment and Limitations:**

Installation of the Cyclic Stick Control Friction to be completed in accordance with Transport Canada approved, Aero Design Ltd. Document Control List DCL952-1 Revision 1, dated 7 August 2014 or later approved revision.

Transport Canada approved Aero Design Ltd. Flight Manual Supplement FMS952.91 Revision 1 dated 6 August 2014, or later approved revision, is required with this installation.

Transport Canada accepted Aero Design Ltd. Instruction for Continued Airworthiness ICA952.90 Revision 1, dated 9 January 2015, or later accepted revision is required with this installation.

Basis of certification: FAR Part 27 including amendments 27-1 through 27-30. (The Bell 407 basis of certification as defined in TCDS H-92).

— End —



Conditions: This approval is only applicable to the type/model of aeronautical product specified therein. Prior to incorporating this modification, the installer shall establish that the interrelationship between this change and any other modification(s) incorporated **will not** adversely affect the airworthiness of the modified product.

F.J.B. Wright
For Minister of Transport



Transport
Canada

Transports
Canada

1100 9700 Jasper Avenue NW
Edmonton, Alberta, T5J 4E6
Canada

Your file 952 Votre référence

Our file C-14-0826 Notre référence
SH12-59 Iss. 2

13 January 2015

Aero Design Ltd.
9888A Malaspina Road
Powell River, British Columbia
Canada V8A 0G3

Subject: STC SH12-59 Issue 2, Bell 206A, B, Lseries, 407, Cyclic Stick Control Friction Replacement.

This Supplemental Type Certificate, SH12-59 Issue 2, is issued in response to your application. Included with this original signature STC SH12-59 Issue 2 are documents bearing original Transport Canada signatures.

The transfer of this STC SH12-59 Issue 2 in the name of another person requires the prior approval from the Minister in accordance with Section 521.357 of the Canadian Aviation Regulations (CAR).

The requirements of CAR 561 apply for parts manufactured under this approval.

Embodiment of this approval is considered to be a maintenance activity and the requirements of subsection 571.06(4) of the CARs will apply.

A Canadian Holder is required to fulfill the responsibilities of a Design Approval Document Holder in accordance with Division VIII of Subpart 521 of the CAR, including the reporting of any service difficulties experienced with their product. Therefore, should you become aware of any defect, malfunction or failure resulting from the design change, it is your responsibility to submit a Service Difficulty Report to Transport Canada.

Yours truly,

J. Staal
Certification Technologist
Engineering, Edmonton
Prairie and Northern Region
780-495-5227
jack.staal@tc.gc.ca

Enclosure(s)

Canada

Enclosure List

Supplemental Type Certificate SH12-59 Issue 2
Flight Manual Supplement FMS952.91 Rev 1 dated 6 August 2014
Document Control List DCL952-1 Rev 1 dated 7 August 2014
Document Control List DCL952-11 Rev 1 dated 7 August 2014
MSI53 for ICA952.90 Rev 1
ICA952.90 Rev 1 dated 9 January 2015
Certification Plan CP952 Rev 3 dated 31 December 2014, with Appendix A initialed.
CPR decision record signed 13 Feb 2015





J. Staal

13 January 2015

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
INSTALLATION DOCUMENTS		
95201	Cyclic Friction Replacement Installation	1
95202	Cyclic Friction Replacement Installation (S/N 254-1657)	0
ICA952.90	Instructions for Continued Airworthiness	1
FMS952.91	Flight Manual Supplement	1
FABRICATION DOCUMENTS		
DCL952-11	Document Control List for Cyclic Friction Replacement Fabrication	1

APPROVAL:  Transport Canada Transports Canada AIRCRAFT CERTIFICATION DIVISION APPROVED By <u><i>[Signature]</i></u> Appr'l No. <u>SH12-59</u> Appr'l Date <u>2012-11-30</u> Issue No. <u>2</u> Issue Date <u>2015-02-13</u> <small>YY-MM-DD</small>		ORIGINAL DATE: 28 November 2012 REVISION DATE: 07 August 2014	 Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada, V8A 0G3 Tel: 604.483.2376 www.aerodesign.ca
SHEET 1 OF 1		Bell 206A, 206B, 206L Series, 407 Cyclic Friction Replacement Installation	
DCL952-1		Rev.	1

DOCUMENT CONTROL LIST

DOCUMENT NO.	DOCUMENT CONTENT	REVISION
FABRICATION DOCUMENTS		
95210	Friction Assembly	1
95212	Threaded Rod Assembly	1
95220	Parts – Tube	1
95222	Parts – Retainer Bushing	1
95224	Parts – Cap	1
95226	Parts – Crescent Bushing	1
95228	Parts – Curved Washer	1
95230	Parts – Barrel Nut	1
95232	Parts – Threaded Rod	1
95234	Parts – Stop	1
95236	Parts – Stop	1
95238	Parts – Curved Washer	1
95240	Friction Assembly (S/N 4-1651)	0
95242	Tube Assembly	0
95252	Parts – Retainer Bushing	0
95254	Parts – Cap	0
ENGINEERING DOCUMENTS		
ER952.01	Engineering Report	1

APPROVAL: <div style="border: 1px solid black; padding: 5px; width: fit-content;"> <div style="display: inline-block; text-align: center;"> <small>Transport Canada</small> </div> <div style="display: inline-block; text-align: center;"> <small>Transports Canada</small> </div> </div> <div style="margin-top: 5px;"> AIRCRAFT CERTIFICATION DIVISION APPROVED By <u><i>[Signature]</i></u> Appr'l No. <u>SH12-59</u> Appr'l Date <u>2012-11-30</u> Issue No. <u>2</u> Issue Date <u>2015-02-13</u> <small>YY-MM-DD</small> </div>		ORIGINAL DATE: 28 November 2012 REVISION DATE: 07 August 2014	<div style="display: inline-block;"> Aero Design Ltd. <small>9888A Malaspina Road Powell River, BC, Canada, V8A 0G3 Tel: 604.483.2376 www.aerodesign.ca</small> </div>
SHEET 1 OF 1		Bell 206A, 206B, 206L Series, 407 Cyclic Friction Replacement Fabrication	
DCL952-11		Rev. 1	

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

APPENDIX A-3 NORMAL CATEGORY ROTORCRAFT – CAR 527

BLOCK 1

Name of the applicant for the design change approval:	Aero Design Ltd.
Description of the design change:	Installation of Cyclic Friction Replacement on Bell 206A, 206B, 206L Series, 407
Certification Basis of design change and revision date:	FAR 27, Amendment 27-44
CAR Standard A527.1(c) Program showing how changes to supplemental ICA made by the applicant or by the manufacturers of products and appliances installed in the aeroplane pursuant to the design change will be distributed:	<div style="text-align: center;">Rev 1</div> Section 0-3 of Supplemental ICA (ICA 952.90)
CAR Standard 513.05 (1) (g) (iv): Installation Instructions:	Installation Drawing 95201, 95202

BLOCK 2

Note: Enter "N/A" when no supplemental ICA are needed.

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.2 (a) Manual(s) (a) The Instructions for Continued Airworthiness must be in the form of a manual or manuals as appropriate for the quantity of data to be provided.	ICA ref: Bell 206/407 Maintenance Manuals: BHT-206A/B-MM / BHT-206L-MM / BHT-407-MM	Supplemental ICA ref: Single Manual (ICA952.90)
A527.2 (b) Practical arrangement (b) The format of the manual or manuals must provide for a practical arrangement.	ICA ref: Bell 206A/206B/206L/407 Maintenance Manuals	Supplemental ICA ref: Arranged in ATA format
A527.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information:		
A527.3 (a) Rotorcraft maintenance manual or section		
A527.3 (a) (1) (Introduction) (1) Introduction information that includes an explanation of the rotorcraft's features and data to the extent necessary for maintenance or preventive maintenance.	ICA ref: Bell 206A/206B/206L/407 Maintenance Manual, Chapter 1	Supplemental ICA ref: Section 0-1
A527.3 (a) (2) (Description) (2) A description of the rotorcraft and its systems and installations including its engines, rotors, and appliances.	ICA ref: Bell 206A/206B/206L/407 Maintenance Manual, Chapter 1	Supplemental ICA ref: Section 0-5

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.3 (a) (3) Control & Operation (3) Basic control and operation information describing how the rotorcraft components and systems are controlled and how they operate, including any special procedures and limitations that apply.	ICA ref: N/A	Supplemental ICA ref: Section 67-4
A527.3 (a) (4) Servicing (4) Servicing information that covers details regarding servicing points, capacities of tanks, reservoirs, types of fluids to be used, pressures applicable to the various systems, location of access panels for inspection and servicing, locations of lubrication points, lubricants to be used, equipment required for servicing, tow instructions and limitations, mooring, jacking, and levelling information.	ICA ref: Bell 206A/206B/206L/407 Maintenance Manual, Chapter 12	Supplemental ICA ref: N/A
A527.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information:		
A527.3 (b) Maintenance Instructions.		
A527.3 (b) (1) Scheduling 1) Scheduling information for each part of the rotorcraft and its engines, auxiliary power units, rotors, accessories, instruments, and equipment that provides the recommended periods at which they should be cleaned, inspected, adjusted, tested, and lubricated, and the degree of inspection, the applicable wear tolerances, and work recommended at these periods. However, the applicant may refer to an accessory, instrument, or equipment manufacturer as the source of this information if the applicant shows that the item has an exceptionally high degree of complexity requiring specialized maintenance techniques, test equipment, or expertise. The recommended overhaul periods and necessary cross-references to the Airworthiness Limitations section of the manual must also be included. In addition, the applicant must include an inspection program that includes the frequency and extent of the inspections necessary to provide for the continued airworthiness of the rotorcraft.	ICA ref: Bell 206A/206B/206L/407 Maintenance Manual, Chapter 5	Supplemental ICA ref: Section 5-1
A527.3 (b) (2) Troubleshooting (2) Troubleshooting information describing probable malfunctions, how to recognize those malfunctions, and the remedial action for those malfunctions.	ICA ref: N/A	Supplemental ICA ref: N/A

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.3 (b) (3) Removal/replacement (3) Information describing the order and method of removing and replacing products and parts with any necessary precautions to be taken.	ICA ref: Bell 206A/206B/206L/407 Maintenance Manual, Chapter 27/67	Supplemental ICA ref: Section 67-1 thru 67-3
A527.3 (b) (4) General (4) Other general procedural instructions including procedures for system testing during ground running, symmetry checks, weighing and determining the center of gravity, lifting and shoring, and storage limitations.	ICA ref: Bell 206A/206B/206L/407 Maintenance Manual, Chapter 7 and 8	Supplemental ICA ref: N/A
A527.3 (c) Access (c) Diagrams of structural access plates and information needed to gain access for inspections when access plates are not provided.	ICA ref: N/A	Supplemental ICA ref: N/A
A527.3 (d) Special inspections (d) Details for the application of special inspection techniques including radiographic and ultrasonic testing where such processes are specified.	ICA ref: Bell 206A/206B/206L/407 Maintenance Manual, Chapter 5	Supplemental ICA ref: Section 5
A527.3 (e) Protective treatment (e) Information needed to apply protective treatments to the structure after inspection.	ICA ref: Bell Standard Practices Manual BHT-ALL-SPM, Chapter 3	Supplemental ICA ref: N/A
A527.3 (f) Fasteners, torque values, etc (f) All data relative to structural fasteners such as identification, discard recommendations, and torque values.	ICA ref: Bell Standard Practices Manual BHT-ALL-SPM, Chapter 2	Supplemental ICA ref: N/A
A527.3 (g) Special tools (g) A list of special tools needed.	ICA ref: N/A	Supplemental ICA ref: N/A

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

BLOCK 3

Note: The statement in block 5 does not constitute an approval of the Airworthiness Limitations Section. Airworthiness Limitations differ from other maintenance tasks, in that they are mandatory, as a direct condition of the approval of the type design. They are therefore referenced directly in the approval document itself. However, they must also be included in the Supplemental Instructions for Continued Airworthiness.

A527.4 AWL - Separate Section 1

The Instructions for Continued Airworthiness must contain a section titled Airworthiness Limitations that is segregated and clearly distinguishable from the rest of the document. This section must set forth each mandatory replacement time, structural inspection interval, and related structural inspection procedure approved under 527.571. If the Instructions for Continued Airworthiness consist of multiple documents, the section required by this paragraph must be included in the principal manual. This section must contain a legible statement in a prominent location that reads: "The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister."

ICA ref: Bell 206A/206B/206L/407
Maintenance Manual, Chapter 4

Supplemental ICA ref: Chapter 4

BLOCK 4 – Applicant Statement of Compliance

The Supplemental ICA referenced above comprises the complete listing of supplemental ICA necessary to show compliance with the regulatory standard that supports this change in type design.

Applicants Signature:  Date: 07 August 2014

Applicants Name: Jeff Clarke, Vice President

BLOCK 5 – Minister's Statement of Acceptability

The design change is adequately supported by existing ICA and/or supplemental ICA, as identified above and is acceptable to the Minister.

Reviewer's Name: JACK STAAL Phone # 780-495-5227 Email: jack.staal@tc.gc.ca Mail Routing Symbol: RAX1

Signature:  Date: 13 Feb 2015 NAPA Number: C-14-0826

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS ICA 952.90

CYCLIC FRICTION REPLACEMENT

Bell 206A, 206B, 206L Series, 407

TCCA Supplemental Type Certificate No. SH12-59
FAA Supplemental Type Certificate No. SR03283NY
EASA Supplemental Type Certificate No. _____

Preface

These Instructions for Continued Airworthiness shall be included in the Bell 206A, 206B, 206L Series, and/or 407 Maintenance Manual when the Cyclic Friction Replacement is installed in accordance with Aero Design Ltd. Document Control List DCL952, Revision 1, or later approved revision.

The information contained herein supplements the information in the basic Maintenance Manual. For Maintenance practices and procedures not contained in these Instructions for Continued Airworthiness refer to the basic Maintenance Manual and its approved supplements.

Revision 1
Date: 09 January 2015

Aero Design Ltd.



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Record of Revisions

Revision Number	Issue Date	Date Inserted	By
0	25 Oct 2012	(Incorporated)	Original Issue
1	09 January 2015		

LIST OF EFFECTIVE PAGES

List of Revisions	Revision 0 (Original Issue)	25 October 2012
	Revision 1	09 January 2015

List of Effective Pages

<u>Title</u>	<u>Pages</u>	<u>Revision No.</u>
Cover	1	1
Revision Record/List of Effective Pages	2	1
Table of Contents	3	1
00-00-00	4-5	1
04-00-00	6	1
05-00-00	7	1
67-00-00	8-11	1

NOTE

Revised text is indicated by a black vertical line. A revised page with only a vertical line next to the page number indicates that text has shifted or that non-technical correction(s) were made on that page. Insert latest revision pages; dispose of superseded pages.

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CHAPTER 0 – INTRODUCTION

0-1 SCOPE

The following Instructions for Continued Airworthiness (ICA) satisfy the requirements of 14 CFR 27.1529, and provide the information necessary to complete the on-going maintenance and inspections required for rotorcraft embodying the Cyclic Friction Replacement as described herein.

0-2 DEFINITIONS AND ABBREVIATIONS

ICA - Instructions for Continued Airworthiness

LH - Left Hand

RH - Right Hand

0-3 DISTRIBUTION

Copies of this ICA and amendments shall be distributed to all known purchasers of the Cyclic Friction Replacement. Requests for a copy may be made in writing to:

Aero Design Ltd.
9888A Malaspina Road
Powell River, BC, Canada
V8A 0G3
Email: info@aerodesign.ca

Any changes will be sent to Transport Canada. All changes will be recorded in the Record of Revisions page at the front of this document.

0-4 COMPATIBILITY

Prior to incorporating this modification, the installer shall establish that the inter-relationship between this change and any other modification(s) incorporated will not adversely affect the airworthiness of the helicopter.

Early Bell 206A helicopters, serial number 4 through 253, are equipped with a different cyclic base than later serial numbers. Installation of the cyclic friction replacement is not applicable to these early serial numbers using the original cyclic base.

Bell 206A and early Bell 206B helicopters, serial number 254 through 1657, are equipped with a different cyclic base than later serial numbers. Installation of the cyclic friction replacement is applicable to these early serial numbers using the original cyclic base.

For Bell 206A and 206B helicopters which have been modified with a cyclic base applicable to a later serial number range the instructions applicable to the serial number range of the cyclic base that is installed will apply.

0-5 GENERAL DESCRIPTION

The cyclic stick control on light Bell helicopters has an adjustable friction device built into the base of the cyclic stick pivot. Two adjustments can be made: a) minimum friction, which is set by the AME (A&P, mechanic or technician), and b) additional friction which can be set by the pilot to suit his preference.

The original design provided by Bell uses differential thread pitches on the cyclic friction shaft to provide clamping force on the cyclic stick pivot ball. Minimum friction is set by the AME at the time of installation and checked periodically with the inspection schedule for the helicopter. There is no way to limit the tightening force that can be applied by the pilot. Excessive tightening causes significant wear on the threads on the shaft and in the barrel nuts.

The new cyclic friction replacement part allows for the minimum friction to be set to the same specifications as the original configuration, in a simpler configuration and process. The additional cyclic friction, applied at the pilot's discretion, is provided by a cam action lever. The cam action provides the mechanical advantage needed to close the gap in the clamp around the cyclic stick pivot ball. Experience with the cam lever arrangement in similar applications shows wear on the mating surfaces is not a significant issue, which will extend the service life of the new part over the original.

CHAPTER 4 - AIRWORTHINESS LIMITATIONS

Transport Canada

The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister.

FAA

The Airworthiness Limitations section is FAA approved and specifies inspections and other maintenance required under Secs. 43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

EASA

The Airworthiness Limitations section is approved and variations must also be approved.

No additional airworthiness limitations have been imposed due the installation of the Cyclic Friction Replacement.

CHAPTER 5 – INSPECTION REQUIREMENTS

5-1 INSPECTION SCHEDULE

Inspections are to be carried out in accordance with the schedule and procedures in the existing Maintenance Manual as applicable to the model of helicopter, or other approved program.

Refer to Maintenance Manual, Chapter 5, as follows:

206A/B: BHT-206A/B-MM-1

206L: BHT-206L-MM-1

206L-1: BHT-206L1-MM-1

206L-3: BHT-206L3-MM-1

206L-4: BHT-206L3-MM-1

407: BHT-407-MM-1

CHAPTER 67 – FLIGHT CONTROLS**67-1 CYCLIC FRICTION REMOVAL**

Removal instructions are applicable if the cyclic friction is removed by itself or as part of removing the entire cyclic stick assembly. Refer to Maintenance Manual Chapter 27 (Bell 206L and 206L-1) or Chapter 67 (Bell 206A, 206B, 206L-3, 206L-4, 407) for removal instructions of the cyclic stick assembly.

Refer to figure 67.1 and 67.1A

1. Remove pilot seat. Refer to Maintenance Manual Chapter 25.
2. Remove pilot seat panel.
3. Place cyclic friction lever in OPEN position (straight out).
4. 206B (S/N 1658 and sub.), 206L, 407: Remove cotter pin (7), nut (6), washers (04/05), and curved washer (03, Fig 67.1) from end of cyclic friction.
206A, 206B (S/N 254 thru 1657): Remove cotter pin (7), nut (6), washers (04/05) from end of cyclic friction. Loosen check nut (3, Fig. 67.1A). Rotate friction assembly counter-clockwise until free of cyclic pivot support assembly.
5. Slide friction assembly out of cyclic pivot support assembly and out of cyclic stick boot.

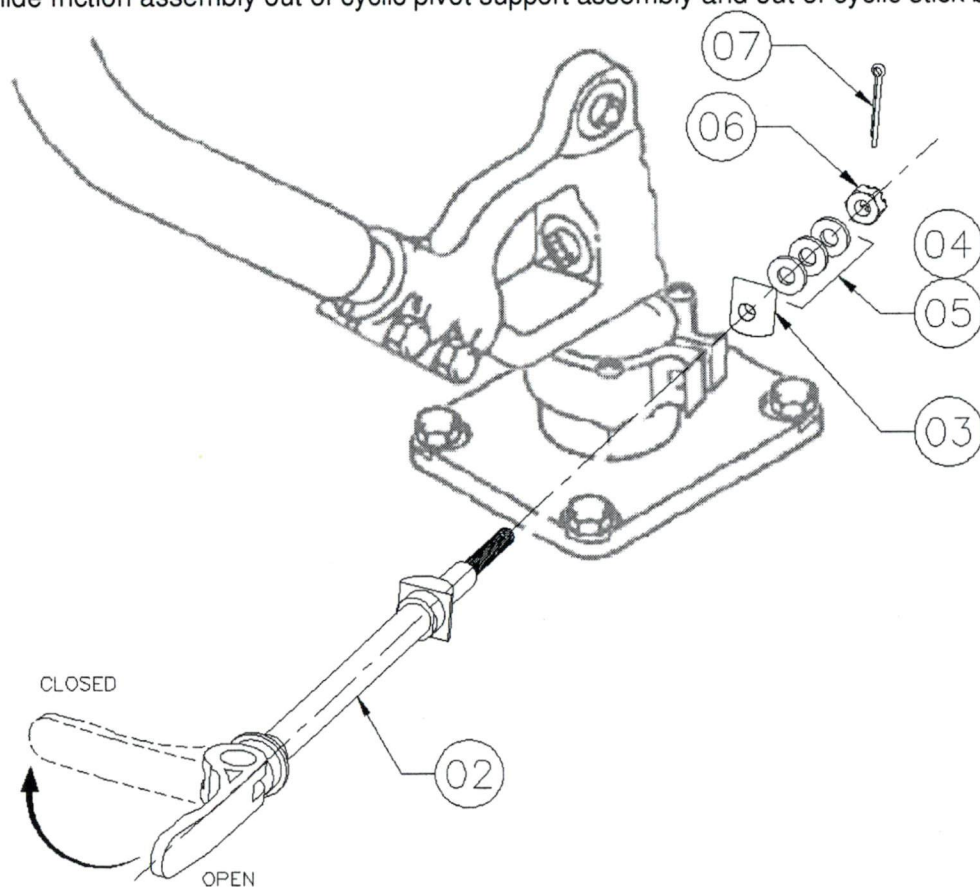


Figure 67.1 – Cyclic Friction Assembly
Bell 206B (S/N 1658 & sub.), 206L, and 407

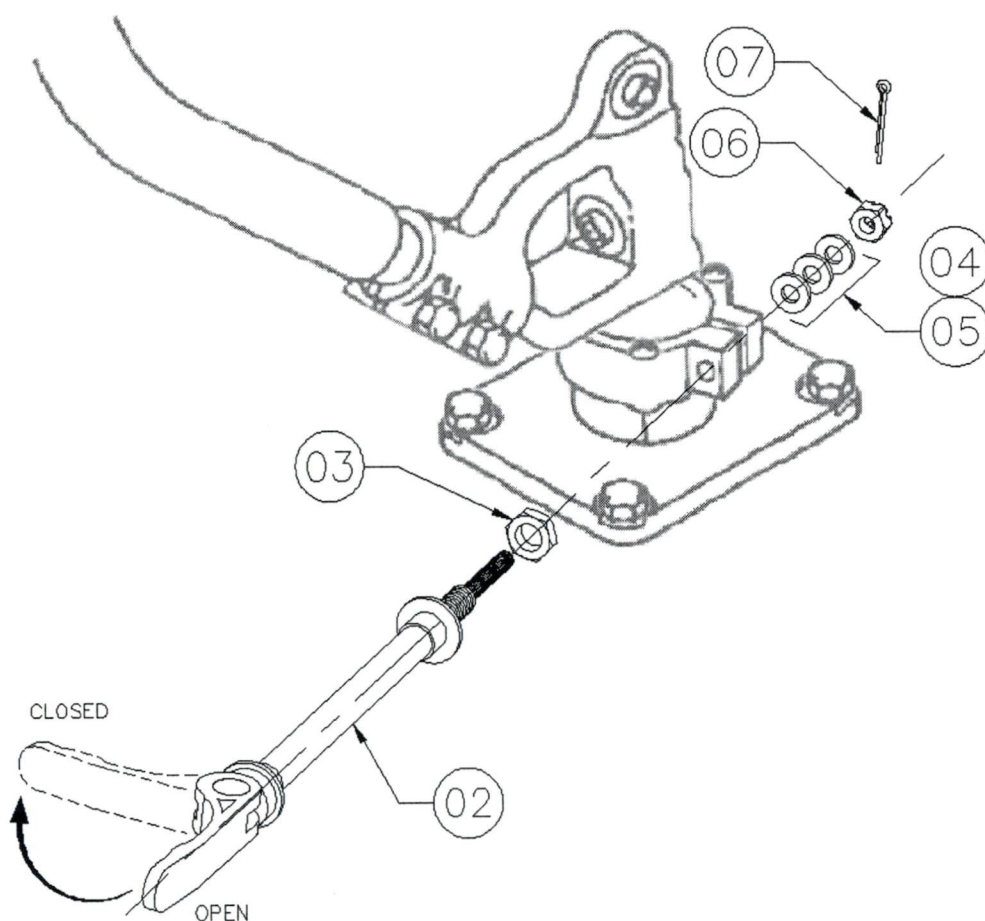


Figure 67.1A – Cyclic Friction Assembly
Bell 206A, 206B (S/N 254-1657)

67-2 CYCLIC FRICTION INSTALLATION

Refer to figure 67.1 and 67.1A

1. Remove pilot seat. Refer to Maintenance Manual Chapter 25.
2. Remove pilot seat panel.
3. 206B (S/N 1658 and sub.), 206L, 407: Slide cyclic friction assembly (02) into cyclic stick boot, seat curved end into cyclic pivot support assembly.
206A, 206B (S/N 254 thru 1657): Thread check nut (03, Fig 67.1A) onto cyclic friction assembly (02). Slide cyclic friction assembly (02) into cyclic stick boot, thread into cyclic pivot support assembly, 0.4 inches (10 mm) minimum. Torque check nut to 60-85 in-lbs (6.8-9.6 N-m).
4. 206B (S/N 1658 and sub.), 206L, 407: Slide curved washer (03) onto threaded end of cyclic friction assembly.
5. Slide NAS1149F0363 (04) and/or NAS1149F0332 (05) washers (as required for minimum friction, see section 67-3) onto threaded end of cyclic friction assembly.

6. Thread AN310-3 castellated nut (06) onto threaded end of cyclic friction assembly. Tighten finger tight plus $\frac{1}{2}$ turn.
7. Set minimum friction in accordance with Section 67-3 (below).
8. Safety the AN310-3 castellated nut with MS24665-153 cotter pin (07) in accordance with AC43.13-1B, section 7-127, in the minimum friction position.
9. 206A, 206B (S/N 254 thru 1657): Apply bead of F-900 torque seal (or equivalent movement indication laquer) to check nut / pivot support joint.
10. Install pilot seat panel and pilot seat. Refer to Maintenance Manual Chapter 25.

67-3 CYCLIC FRICTION ADJUSTMENT - MINIMUM FRICTION

The Bell cyclic friction knob and shaft configuration is replaced. When adjusting, or checking, the minimum cyclic friction for the Aero Design Cyclic Friction configuration refer to the applicable Bell Maintenance Manual while noting the following:

1. When checking or adjusting the minimum cyclic friction set the cam lever to the OPEN position (straight out) and loose (no cam lever pressure), reference figure 67.2 to loosen.
2. Set minimum friction to appropriate Bell specification by adjusting the castellated nut (06, figure 67.1 or 67.1A, AN310-3). A maximum of 8 washers (04 and/or 05, NAS1149F0332P and/or NAS1149F0363P) may be used to position the nut in line with cotter pin hole in rod. Re-check minimum friction if washer stack is changed.
3. Ensure the castellated nut is safetyed with a new cotter pin (07, MS24665-153) in accordance with Bell standard practices.

Note: Bell specified spring scale force values, measuring procedures, and helicopter preparations remain unchanged, refer to the applicable Maintenance Manual:

206A/B: BHT-206A/B-MM-8, Chapter 67

206L: BHT-206L-MM-1, Chapter 27

206L-1: BHT-206L1-MM-1, Chapter 27

206L-3: BHT-206L3-MM-8, Chapter 67

206L-4: BHT-206L3-MM-8, Chapter 67

407: BHT-407-MM-8, Chapter 67

Standard Practices Manual: BHT-ALL-SPM

67-4 OPERATING INFORMATION

The pilot may increase friction beyond the minimum as set by rotating the cam lever to the closed position.

To adjust the amount of friction provided by the cam action above the minimum friction:

1. Set cam lever to OPEN position (straight out).
2. Fold cam lever as required to apply desired additional friction. Rotate lever clockwise to increase additional friction, counter-clockwise to reduce additional friction.
3. Fold cam lever to CLOSED position (perpendicular to shaft) to apply maximum friction.

CAUTION

Avoid setting the cam lever where the CLOSED position points between the 9 o'clock and 12 o'clock position when looking aft, see figure 67.2.

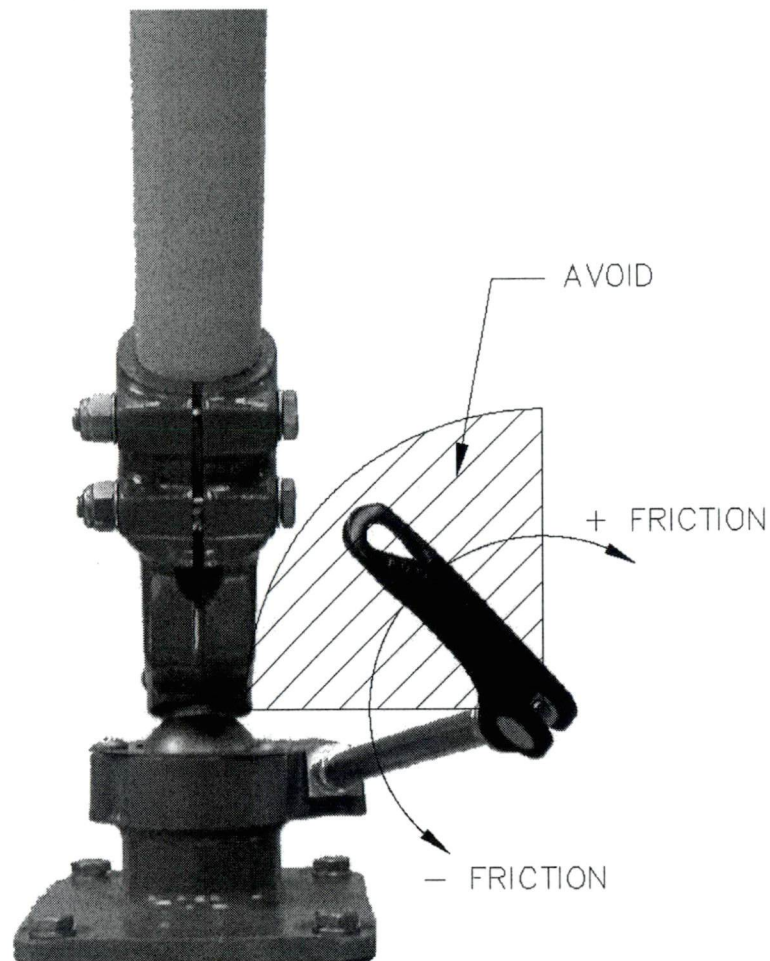


Figure 67.2 – Cam Lever Avoid Region
(Looking aft)

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FMS952.91

BELL 206A, 206B, 206L Series, 407

ROTORCRAFT FLIGHT MANUAL SUPPLEMENT for the INSTALLATION of the AERO DESIGN CYCLIC FRICTION REPLACEMENT

Canadian Supplemental Type Certificate No. SH12-59
FAA Supplemental Type Certificate No. SR03283NY
EASA Supplemental Type Certificate No. _____

Sections I, II, III and IV of this document comprise the Transport Canada Approved sections of this Flight Manual Supplement. Compliance with Section I, Limitations, is mandatory.

Section V and any subsequent sections if present are Unapproved and are provided for information only.

The information and data contained in this Flight Manual Supplement supersede or supplement that contained in the basic Approved Flight Manual for the Bell 206A, 206B, 206L Series, or 407 when fitted with the Cyclic Friction Replacement. For limitations, procedures and performance not listed in this Flight Manual Supplement, refer to the Approved Flight Manual and other approved Flight Manual Supplements.



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I	Limitations	3
II	Normal Procedures	3
III	Emergency Procedures	3
IV	Performance	3
V	Operating Information	4

Record of Revisions

Revision	Issue Date	Pages Revised	Date Inserted	By
0	26 Oct 2012	None		
1	06 Aug 2014	1, 2, 4		

I LIMITATIONS

No change from basic Approved Flight Manual.

II NORMAL PROCEDURES

No change from basic Approved Flight Manual.

Note: Application of additional cyclic friction is achieved by rotating cam lever aft. See section V for further instructions.

III EMERGENCY PROCEDURES

No change from basic Approved Flight Manual.

IV PERFORMANCE

No change from basic Approved Flight Manual.

V OPERATING INFORMATION

The pilot may increase friction beyond the minimum as set by folding the cam lever to the closed position.

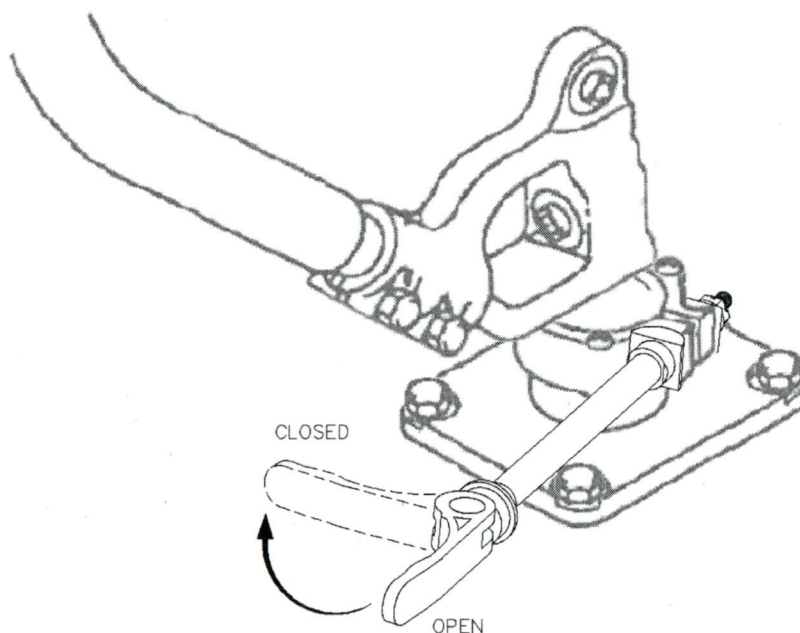


Figure V.1 – Cyclic Friction Operation

To adjust the amount of friction provided by the cam action above the minimum friction:

1. Set cam lever to OPEN position (straight out).
2. Fold cam lever as required to apply desired additional friction. Rotate lever clockwise to increase additional friction, counter-clockwise to reduce additional friction.
3. Fold cam lever to CLOSED position (perpendicular to shaft) to apply full friction.

CAUTION

Avoid setting the cam lever where the CLOSED position points between the 9 o'clock and 12 o'clock position when looking aft, see figure V.2.

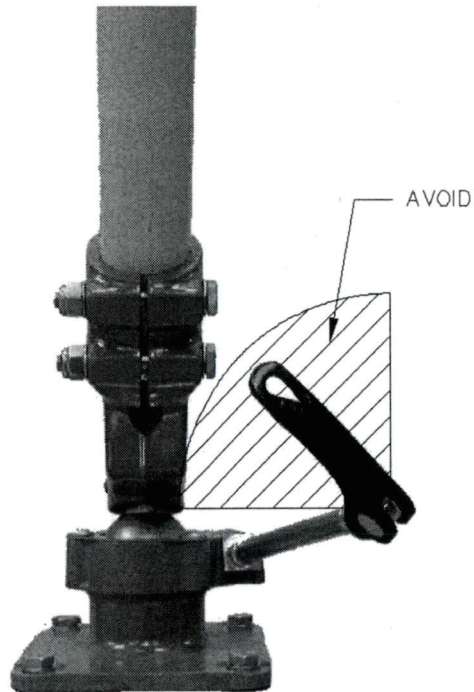



Figure V.2 – Cam Lever Avoid Region
(Looking aft)

CHANGED PRODUCT RULE (CPR) DECISION RECORD

(This form should be signed with the Design Change Approval Application Form 26-0469)

CPR Steps (Figure 1 of AMA 500/16)	Rationale
Step 1: Has the proposed change to the aeronautical product been identified? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	(Per section 5.4 of AMA 500/16) The area(s) affected by the change have been detailed in document number(s): _____
Step 2: Is the change substantial? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	(Per section 5.5 of AMA 500/16) _____
Step 3: Will the latest standards be used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	(Per section 5.6 of AMA 500/16) applicant accepts the use of the latest amendments to the standards for all areas affected by the change.
Step 4: Is the proposed change significant? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	(Per section 5.7 of AMA 500/16) _____
Decision: Will the latest standards be used? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	applicant accepts the use of the latest amendments to the standards for all areas affected by the change.
Step 5: For every area, is the area affected by the proposed change? <input type="checkbox"/> Yes <input type="checkbox"/> No	(Per section 7.4 of AMA 500/16) The area(s) affected by the significant change have been detailed in Certification Plan or Compliance Program (or equivalent) document number(s): _____
Step 6(a): Do the latest standards contribute materially to the level of safety? <input type="checkbox"/> Yes <input type="checkbox"/> No	A delegate may develop a proposal for the Yes/No decision of Step 6(a) and (b), however, TCCA will make the final determination of the acceptability of these exceptions. (Per section 7.5 of AMA 500/16) _____
Step 6(b): If the latest standards contribute materially to the level of safety are they practical? <input type="checkbox"/> Yes <input type="checkbox"/> No	(Per section 7.5 of AMA 500/16) _____
Has an Issue Paper been generated to document the certification basis and to record the decisions made? <input type="checkbox"/> Yes <input type="checkbox"/> No	_____
Under the authority vested in me by the Minister, I have examined the change in type design listed above according to established procedures and hereby determine that it is <u>significant</u> / not-significant pursuant to subsection 511.13(3) or 513.07(3) of the CARs, to the best of my knowledge and belief.	
Name and Signature 	TC AC Engineer <u>my Tech</u> Date <u>13 Feb 2015</u>

CERTIFICATION PLAN
CP952

BELL 206A, B, L SERIES, 407

CYCLIC FRICTION REPLACEMENT
REVISION TO UPDATE HOLDER

Prepared by: Jeff Clarke, P.Tech.(Eng.)

Revision 3, 31 December 2014
(supplements Compliance Program CP952, Rev. 1)

Aero Design Ltd.



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1.0 INTRODUCTION

This certification plan details the means and methods of compliance for the Airworthiness Requirements shown on the Compliance Program (Appendix A).

This reissue of approval SH12-59 to issue 2 is to update the holder address and incorporate minor design changes into the approval. Application for an EASA STC and amendment to FAA STC SR03283NY will follow reissue of the Canadian approval.

2.0 PROJECT DESCRIPTION

2.1 Current Configuration

The cyclic stick control on light Bell helicopters has an adjustable friction device built into the base of the cyclic stick pivot. Two adjustments can be made: a) minimum friction, which is set by the AME; and b) additional friction which can be set by the pilot to suit his preference.

The minimum friction is applied by adjusting the position of two barrel nuts on the cyclic friction shaft to provide the minimum specified friction and tightening a castellated nut (item 10, fig. 2.1.2) on the end of the cyclic friction shaft to prevent the shaft from unthreading further and secured with a cotter pin, in accordance with instructions found in the Bell Maintenance Manual. This adjustment is made by removing the pilot's seat and seat panel and is not accessible except when opened up for maintenance activities.

The additional friction applied at the pilot's discretion, is provided by rotating the cyclic friction shaft (item 18) which projects out from under the pilot's seat. The shaft has two (2) sections of thread: one section is a 5/16-24 UNF thread and the other section is a 1/4-20 UNC thread. Each section of threaded shaft is fitted onto its own barrel nut (items 12 and 17) which spans a gap in the clamp which tightens on the Cyclic Stick Pivot ball. As the shaft is rotated, the distance between the barrel nuts increases/decreases due to the differential between the two thread pitches causing a clamping action with considerable mechanical advantage. A knob (approx. 1.5 in. dia.) is fitted to the end of the shaft protruding forward from under the pilot's seat allowing the pilot to make adjustments while seated.

The Bell cyclic stick friction is shown on Fig. 27-8 from the Bell 206L Maintenance Manual, as shown below.

The Bell Flight Manuals do not provide any guidance as to what the additional friction provided by the pilot is supposed to do or how to operate the control except to say: "Tighten friction as desired". In practice, the cyclic friction is tightened up to hold the cyclic control when the pilot exits the helicopter while the main rotor is still turning. This may be when the rotor is spooling down after the engine has been shut down or in some cases with the engine running (pilot only hot refueling)

When required, to ensure that there is no movement of the stick, pilot's torque up the cyclic stick friction as hard as they can with the size of the knob provided. The result is severe wear on the shaft threads and associated barrel nuts. It is common to replace these components every season and in the extreme they may be replaced several times during a season.

A new cyclic friction device has been designed to eliminate the wear issues found in the Bell parts and the resulting costly annual maintenance.

The minimum cyclic friction is set by the AME using washers, a castellated nut and cotter pin onto the end of the shaft to pretension the assembly to apply the minimum friction. The instructions in the Bell maintenance manual related to setting minimum friction are applicable.

The additional cyclic friction, applied at the pilot's discretion, is provided by a cam action similar to that used on a quick-release bicycle hub. The cam action provides the mechanical advantage needed to close the gap in the clamp around the Cyclic Stick Pivot ball. Cam-action quick-release bicycle hubs have been used on racing bikes for over sixty years. Experience has demonstrated them to be reliable and not subject to excessive wear.

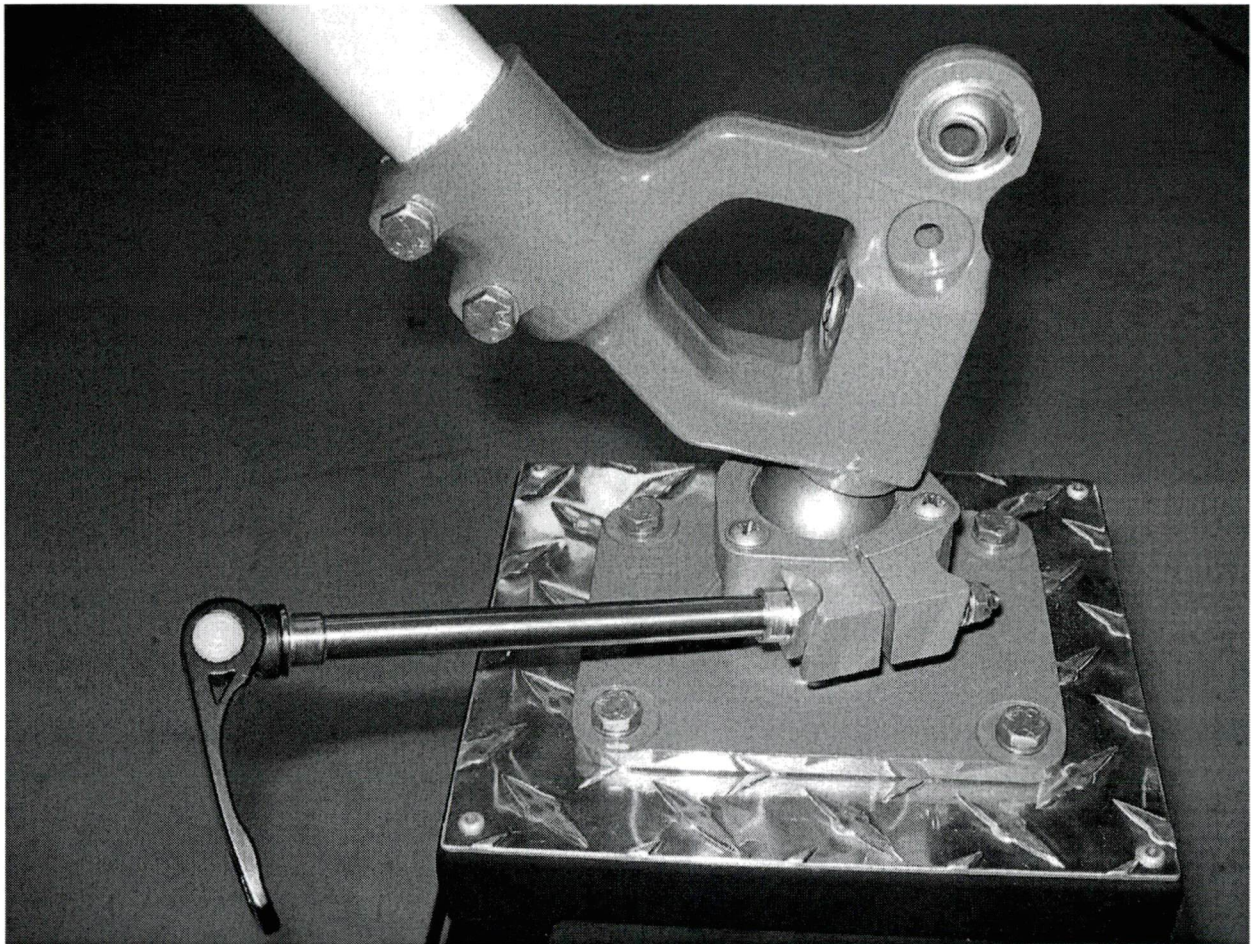
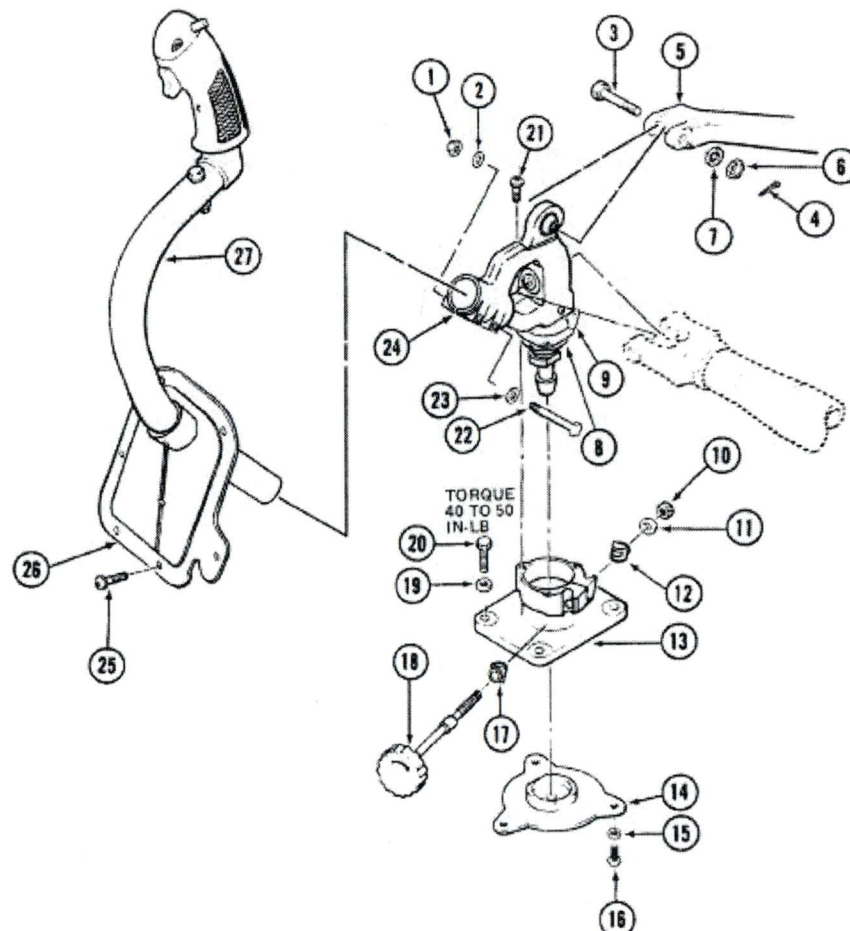


Figure 2.1.1 – Replacement Cyclic Friction Installation

MAINTENANCE MANUAL

Model 206L-1



12. Barrel Nut,
13. Pivot Support

17. Barrel Nut
18. Knob and Shaft

10. Nut
11. Aluminum Washer

Figure 27-8. Cyclic stick and torque tube (Sheet 1 of 2)

27-20-00
27-23

Figure 2.1.2 – Bell 206L Maintenance Manual Excerpt

2.2 Early Serial Number Configuration

Bell 206A and early 206B models, serial number 254 through 1657, use a different cyclic base than the subsequent models currently on this approval, unless the cyclic base has been replaced with the current configuration. On these early serial numbers, the cyclic base was threaded with the different thread pitches to achieve friction as the knob and shaft are rotated. This configuration was replaced with the configuration described above, which allows the tightening shaft to remain straight while the cyclic base pinches in to apply friction to the cyclic pivot ball.

The replacement cyclic friction assembly is made of substantially the same parts as the currently approved configuration, the primary change being the bottom end of the friction is threaded into the cyclic base, instead of seating into the curved recess for the barrel nut. The far side of the friction does not thread into cyclic base, which allows the smaller threaded rod to align inside the far hole to the friction as the cyclic base is pinched. Installed position, operation procedures, and minimum friction setup procedure all remain the same.

3.0 BASIS OF CERTIFICATION

TCDS H-92, Issue 26:

Bell 407 Basis of Certification (latest of all models on TCDS)

FAR part 27, dated October 2, 1964 Amdt 27-1 through 27-30 with the following exceptions:

Ultimate inertia load factors Section 27.561(b)(3)(i-iv) remain at the levels specified by Section 27.561(b)(3) at Amdt 27-0;

Section 27.563 at Amdt 27-25;

Section 27.785 at Amdt 27-21;

Section 27.1093 at Amdt 27-8;

Section 27.173 and 27.175 at Amdt 27-1;

Section 27.562, 27.1195, 27.952(b)(1) n/a.

Plus the following sections of Canadian Airworthiness Manual, Change 527-8 dated June 30, 2009;

527.1093(b)(i)(ii) and (iii) Induction System Icing Protection

527.1301-1 Rotorcraft Operations After Ground Cold Soak

527.1557(c)(3) Miscellaneous Markings and Placards

527.1581(e) Rotorcraft Flight Manual

527.1583(h) Operating Limitations

4.0 APPLICABILITY OF AIRWORTHINESS DIRECTIVES

Airworthiness Directives applicable to the Bell 206A, B, L Series and 407 were reviewed on 04 August 2014, and none were found to affect this project.

5.0 PERSONNEL

Applicant: Aero Design Ltd. – Jeff Clarke, P.Tech.(Eng.)

Delegate: None – no changes to findings of compliance, see section 6.0 and 7.0

Transport Canada: Jack Staal, PNR Region

6.0 CERTIFICATION PLAN

Re-issue of the approval is to reflect the change of address of the holder. Minor changes to the approved drawings are also incorporated at this issue. Evaluation of the changes is addressed in Section 7.0. There are no changes to the design data that invalidate the existing findings of compliance.

6.1 CAR 527 Subpart G – Operating Limitations and Information

Paragraphs 527.1581, .1585

6.1.1 Means of Compliance

- a) Flight Manual Supplement

6.1.2 Method of Compliance

- a) Flight Manual Supplement provided which includes operating procedures for replacement cyclic friction.

6.1.3 Compliance Documents, Data and Testing

Flight Manual Supplement FMS952.91 to Revision 1

Changes from TCCA approved revision 0:

1. Cover: Contact information added; update approval numbers, add 206A
2. Section V – Operating Information: Change “rotate cam lever” to “fold cam lever” as terms were causing confusion.

6.1.4 Schedule

FMS952.91 submit to TC for review by 15 August 2014

6.1.5 Level of Delegation

None

6.1.6 Level of Involvement

Deliverable	Transport Canada Level of Involvement
FMS952.91	Requires Transport Canada review and approval

6.2 527.1529

6.2.1 Means of Compliance

- a) Instructions for Continued Airworthiness provided

6.2.2 Method of Compliance

- a) Instructions for Continued Airworthiness are prepared in accordance with CAR 527 Appendix A

6.2.3 Compliance Documents, Data and Testing

Instructions for Continued Airworthiness ICA952.90 to Revision 1

Changes from TCCA accepted Revision 1:

3. Cover: Contact information updated; add approval numbers, add 206A
4. Section 0-3: Contact information updated
5. Section 0-4: Changed compatibility statement for early S/Ns
6. Section 4: Add EASA limitation statement
7. Section 5-1: Add 206A model, uses existing manual reference
8. Section 67-1 and 67-2: Add instructions to remove/install early S/N configuration.
9. Section 67-3: Minimum friction adjustment instructions provided, original maintenance manual references were not directly applicable.
10. Section 67-4: Change "rotate cam lever" to "fold cam lever" as terms were causing confusion.

6.2.4 Schedule

ICA952.90 – submit to TC for review by 15 August 2014

6.2.5 Level of Delegation

None

6.2.6 Level of Involvement

Deliverable	Transport Canada Level of Involvement
ICA952.90	Requires Transport Canada review and acceptance

7.0 EFFECT OF CHANGES ON EXISTING FINDINGS OF COMPLIANCE

All documents - excluding engineering reports, load test reports, flight test reports or similar documents - are revised to incorporate the new company contact information and logo, which does not affect any finding of compliance. Changes beyond the address and logo are addressed below. A list of all changed documents is in Appendix B.

7.1 New Configuration to Accommodate Early Serial Number Helicopters

Bell 206A and early 206B models, through serial number 1657, use a different cyclic base than the subsequent models currently on this approval, unless the cyclic base has been replaced with the current configuration. On these early serial numbers, the cyclic base was threaded with the different thread pitches to achieve friction as the knob and shaft are rotated. This configuration was replaced with barrel nuts on subsequent serial numbers, which would allow the tightening rod to remain straight while the cyclic base pinches in to apply friction to the cyclic pivot ball.

The friction assembly is made of substantially the same parts as the currently approved configuration, the primary change being the bottom end of the friction is threaded into the cyclic base, instead of seating into the curved recess for the barrel nut. The far side of the friction does not thread into cyclic base, which allows the smaller threaded rod to align to the friction as the cyclic base is pinched. Installed position, operation procedures, and minimum friction setup procedure all remain the same. The new configuration does not contain any features that invalidate the findings of compliance for the original configuration.

7.2 Document Control List DCL952-1 to Revision 1 – Cyclic Friction Replacement Installation

FMS952.91 to Revision 1 addressed in section 6.0 above. Requires TCCA approval.

ICA952.90 to Revision 1 addressed in section 6.0 above. Requires TCCA acceptance.

7.2.1 Drawing 95201 to Revision 1 – Cyclic Friction Replacement Installation

~~Change: Bell 206B eligibility changed from S/N 1658 to 1652.~~

~~Reason: Incorrect S/N specified.~~

~~Effect: None.~~

Maintenance manual and parts book indicate different serial ranges. Revert back to MM range.

7.2.2 Drawing 95202 to Revision 0 – Cyclic Friction Replacement Installation (S/N 254-1657)

Change: New drawing.

Reason: See 7.1. New installation instructions are provided as the new configuration requires the friction to be threaded into the cyclic base and locked in place with a check-nut, which is then marked with torque indicating paint.

Effect: The new configuration does not contain any features that invalidate the findings of compliance for the original configuration.

7.3 Document Control List DCL952-11 to Revision 1 – Cyclic Friction Replacement Fabrication

7.3.1 Drawing 95210 to Revision 1 – Cyclic Friction Assembly

Change: Note 1 item numbers corrected.

Reason: Item numbers referenced are incorrect.

Effect: None.

7.3.2 Drawing 95212 to Revision 1 – Threaded Rod Assembly

Change: Weld moved to inside ends of stops (item 03/04)

Reason: The parts are small, and the heat of the weld required to fill the hole in the stops with filler rod causes the threaded rod to deform from straight on the original configuration, though the shafts can be easily straightened before assembly. The revised configuration allows a smaller weld to achieve the same retention of the stops on the threaded rod, reducing deformation.

Effect: None.

Change: Cotter pin hole size increased from #49 (0.073") to 5/64" (0.078").

Reason: Drilling into threads with this small drill bit could cause the bit to deflect into the bottom of the thread, which in turn would cause the hole to wander slightly from the centre of the threaded rod, preventing the hole from aligning with the castellations on the nut on installation. The slight increase in hole size, combined with new tooling to ensure drill position on the threaded rod, allows better quality control and makes the fit of the cotter pin more in line with standard hardware.

Effect: None. Drill size is within the tolerance for the cotter pin hole specified for AN3 bolts.

Change: Spacing between stops reduced from 4.188" to 4.138".

Reason: The combined tolerances on the assembled components could allow for the possibility of insufficient travel of the threaded rod to provide full friction before bottoming out against the stop.

Effect: None. The lower stop must remain seated against the flange of the retainer bushing over the range of travel of the threaded rod. This change is not sufficient to allow the lower stop to possibly become unseated.

7.3.3 Drawing 95224 to Revision 1 – Cap

Change: Stock diameter reduced from 0.75" to 0.625"

Reason: Incorrect stock specified on drawing.

Effect: Flange at 0.75" is wider than the seat of cam lever (95228-01), smaller stock is sufficient.

7.3.4 Drawing 95226 to Revision 1 – Crescent Bushing Drawing 95238 to Revision 1 – Curved Washer

Change: Anodize finish added.

Reason: No finish specified on original drawing.

Effect: Corrosion protection provided.

7.3.5 Drawing 95230 to Revision 1 – Barrel Nut

Change: Material changed from nylon to brass.

Reason: Feedback from operators indicates that many are hesitant to trust plastic material for this component, even with the STC approval in place. Foundation for this concern could not be proven through testing, as every test resulted in the friction assembly bending without the threads tearing out of the nylon barrel nut.

Due to this feedback, a manufacturing review board was assembled under the guidelines set out in the Aero Design Ltd. Manufacturing Policy Manual under AMF 73-04. The board reviewed the concerns and concluded that changing the material to brass and using a self locking helicoil (see below) improve the strength over the original part and do not affect the use of the assembly as a whole.

Effect: Strength increased over original configuration.

Change: Thread changed from #10-32 to #10-32 self-locking helicoil insert.

Reason: The original intent of using nylon for this part was to provide some “drag” on the threaded rod, to prevent the cam lever from rotating down under its own weight when the cam is open. The self locking helicoil provides this function, as well as providing increased thread contact area with the brass.

The helicoil specified is made of Nitronic 60 stainless steel that resists galling better than standard 304 stainless steel helicoils. This quality is desirable in this application because the threaded rod is also stainless steel, and the cam lever may be threaded in and out repeatedly by different pilots using the same aircraft.

Effect: Strength increased over original configuration. Function retained.

7.3.6 Drawing 95234 to Revision 1 – Stop Drawing 95236 to Revision 1 – Stop

Change: Side hole (for welding) removed. See drawing 95212 to revision 1.

Reason: Drilling the hole in the stops during the manufacturing process can deform the internal threads, requiring re-tapping to clear the threads before assembly with the threaded rod to prevent galling. Configuration of the threaded rod changed to weld stops on ends, hole is no longer required.

Effect: None.

APPENDIX A

COMPLIANCE PROGRAM CHECKLIST

APPLICANT: Aero Design Ltd.
9888 A Malaspina Road
Powell River, BC, Canada
V8A 0G3

DATE: 27 November 2012 (Original)
REVISION No. 3 31 December 2014

CORRESPONDANCE TO:
(If other than applicant)

MAKE: Bell
MODEL: 206A, 206B, 206L (all models), 407

REGISTRATION: All Eligible
SERIAL No.: All Eligible


NATURE OF WORK: Quick Release Mounting Provisions Installation; Quick Release Cargo Basket Installation

TYPE CERTIFICATE DATA SHEET: H-92, Issue 26

MODEL CERTIFICATION BASIS: FAR 27 dated 1 February 1965, including amendments 27-1 thru 27-30 (Bell 407, latest of all models)

MODIFICATION CERTIFICATION BASIS: FAR 27 dated 1 February 1965, including amendments 27-1 thru 27-30 (Bell 407)

Airworthiness Requirement	Change from CP Rev. 1	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
Subpart B		Flight				
27.29	No	Empty Weight and Corresponding C of G	N/A			No change from Type Approved configuration
Subpart D		Design and Construction				
27.601	No	Design	Drawings			
27.603	No	Materials	Drawings			
27.605(a)	No	Fabrication Methods	Drawings			
27.607(b)	No	Fasteners	Drawings			
27.609	No	Protection of Structure	Drawings			
27.611	No	Inspection Provisions	Drawings			
27.679(a)	No	Control system locks – warning engaged	Statement in report			No change from Type Approved configuration
27.679(b)	No	Control system locks – in flight	Cockpit evaluation			
27.777	No	Cockpit Controls	Statement in Report			
Subpart G		Operating Limitations and Information				
27.1529	Yes	Instructions for Continuing Airworthiness	ICA Provided	X		
27.1581	Yes	Rotorcraft Flight Manual – General	Flight Manual Supplement Provided	X		

Airworthiness Requirement	Change from CP Rev. 1	Subject for Compliance or Documentary Proof	Form of Substantiation	DOT	DAR	Comments
27.1585	No	Operating Procedures	Flight Manual Supplement Provided			Instructions provided in the existing Flight Manual are applicable without change. Additional instructions on use of friction are provided.

APPENDIX B

LIST OF CHANGED DOCUMENTS

Number	Title	Rev (current approved)	Rev (new)	Description of change
SH12-59	Transport Canada STC	1	2	New address, changes below
SR03283NY	FAA STC	original	(amend)	New address, changes below
	EASA STC			New
CP952	Certification Plan - Including compliance program	0	2 0	Shows changes from and supplements TC accepted CP952 Rev.
DCL952-1	Document Control List – Cyclic Friction Replacement Installation	0	1	Changes below, new address
95201	Cyclic Friction Installation	0	1	TB (Title block updated for new address)
95202	Cyclic Friction Installation – Bell 206A/B S/N 4-1651	--	0	New
FMS952.91	Flight Manual Supplement	0	1	Approval #'s on cover
ICA952.90	Instructions for Continued Airworthiness	0	1	New address, added configuration
DCL952-11	Document Control List - Cyclic Friction Replacement Fabrication	0	1	Changes below, new address
95210	Friction Assembly	0	1	TB, item #'s in note 1.
95212	Threaded Rod Assembly	0	1	TB, welds moved, stops shifted, cotter pin hole
95220	Parts – Tube	0	1	TB
95222	Parts – Retainer Bushing	0	1	TB
95224	Parts – Cap	0	1	TB, stock size corrected
95226	Parts – Crescent Bushing	0	1	TB, anodizing added
95228	Parts – Curved Washer	0	1	TB
95230	Parts – Barrel Nut	0	1	TB, material changed to brass, helicoil added
95232	Parts – Threaded Rod	0	1	TB
95234	Parts – Stop	0	1	TB
95236	Parts – Stop	0	1	TB
95238	Parts – Curved Washer	0	1	TB, anodizing added
95240	Friction Assembly (S/N 4-1651)	--	0	New
95242	Tube Assembly	--	0	New
95252	Parts – Retainer Bushing	--	0	New
95254	Parts – Cap	--	0	New
ER995.01	Engineering Report	1	1	No change



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Our file Votre référence
SR03283NY

20 July 2015

C-15-0516
SH12-59, Iss. 2

Department of Transportation
Federal Aviation Administration
New York Aircraft Certification Office ANE-170
1600 Stewart Avenue, Suite 410
Westbury, NY, 11590
USA

Attention: Mr Gaetano Sciortino

Subject: STC SH12-59 Issue 2, Bell Helicopters 206 /407, Installation Cyclic Stick Control Friction, Reissue of FAA STC SR03283NY, Aero Design Ltd.

We have received an application from a Canadian company, Aero Design Ltd., for the reissue of a Canadian Supplemental Type Certificate and reissue of the FAA STC SR03283NY for amendments to the Cyclic Stick Control Friction installation on certain Bell 206 /407 helicopters.

The Certification Plan CP952 Rev 3 gives a description of the changes with this reissue.

We have reviewed the applicant's submission and certify that the design change complies with the basis of certification specified in Canadian Type Certificate H-92. We have issued STC SH12-59 Iss. 2 dated February 13, 2015.

We also confirm that compliance is demonstrated with FAA Type Certificate H2SW unless additional technical conditions are applied by the FAA.

"In accordance with the FAA Memorandum on Deviation Request to FAA Order 8110.4C, 8110.115, and 8110.54A dated October 9, 2012, TCCA confirms that ICAs related to this STC application meet the content and format of MSI 53 (determined to be equivalent to FAA Order 8110.54, 14 CFR 23.1529, 25.1529, 27.1529, 29.1529, 25.1729,

31.82, 33.4 Part 26 as appropriate) and, that TCCA will take appropriate corrective actions for any ICA issues related to this STC which may arise during post-certification sampling to be conducted by the FAA."

Canada

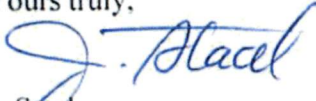
Please consider this to be a formal application for an FAA STC reissue under the provisions of the Canada/U.S. Bilateral Airworthiness Agreement.

In support of this application documentation per the enclosed Aero Design Ltd letter of 13 April 2015 is attached. Soft copies of the documents are included on the enclosed CD.

The original of FAA STC SR03283NY Issued June 5, 2013 with the transfer endorsement completed is also enclosed with this package. (This transfer protocol was FAA requested for a previous FAA STC reissue application for Aero Design Ltd and thus has been completed herewith as well.)

Contact the undersigned if needed.

Yours truly,



J. Staal
Certification Technologist
Engineering, Edmonton
Prairie and Northern Region
780-495-5227
jack.staal@tc.gc.ca

Enclosure(s)

cc: Aero Design Ltd., Powell River, B.C.



Aero Design Ltd.
604-483-AERO (2376)

9888A Malaspina Road
Powell River, BC, Canada, V8A 0G3

13 April 2015

Transport Canada
Aircraft Certification Division
11th Floor, Canada Place
9700 Jasper Avenue
Edmonton, Alberta
T5J 4E6

Attn: Jack Staal

Your File :
Our File : 952

Re: Bell Light Helicopter Cyclic Friction - FAA STC Revision

Jack,

Please find attached the following documents in support of application for revision to
FAA STC SR03283NY:

Modification Approval Request Application Form		
FAA STC Application form 8110-12		
FAA STC - New address and transfer endorsed	SR03283NY	Original
Letter authorizing transfer endorsement of STC		
Transport Canada STC	SH12-59	Issue 2
Certification Plan	CP952	Rev. 3
Document Control List	DCL952-1	Rev. 1
Document Control List	DCL952-11	Rev. 1
Flight Manual Supplement	FMS952.91	Rev. 1
Instructions for Continued Airworthiness	ICA952.90	Rev. 1
MSI 53 Review of ICA952.90 Rev. 1		

Drawings		
Cyclic Friction Installation (S/N 1658 and sub.)	95201	Rev. 1
Cyclic Friction Installation (S/N 254 - 1657)	95202	Rev. 0
Friction Assembly (S/N 1658 and sub.)	95210	Rev. 1
Threaded Rod Assembly	95212	Rev. 1
Parts - Tube	95220	Rev. 1
Parts - Retainer Bushing	95222	Rev. 1
Parts - Cap	95224	Rev. 1
Parts - Crescent Bushing	95226	Rev. 1
Parts - Curved Washer	95228	Rev. 1
Parts - Barrel Nut	95230	Rev. 1
Parts - Threaded Rod	95232	Rev. 1
Parts - Stop	95234	Rev. 1
Parts - Stop	95236	Rev. 1
Parts - Curved Washer	95238	Rev. 1
Friction Assembly (S/N 254-1657)	95240	Rev. 0
Tube Assembly	95242	Rev. 0
Parts - Retainer Bushing	95252	Rev. 0
Parts - Cap	95254	Rev. 0



Aero Design Ltd.
604-483-AERO (2376)

9888A Malaspina Road
Powell River, BC, Canada, V8A 0G3

A CD with the above data is included for submission to the FAA.

Regards,

Jeff Clarke, P.Tech.(Eng.)
Vice President

Encl.



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13 April 2015

Department of Transportation
Federal Aviation Administration
New York Aircraft Certification Office ANE-170
1600 Stewart Avenue, Suite 410
Westbury, NY, 11590
USA

Attention: Mr. Ray Reinhardt, Program Manager.

Re: FAA SR03283NY, Bell Light Helicopter Cyclic Friction Replacement

Please find enclosed original US STC SR03283NY, endorsed on the back with the new address for Aero Design Ltd. Mr. Clarke is vice president of Aero Design Ltd. and as such is authorized to make this endorsement on behalf of the company.

If you need anything further please feel free to contact me.

Regards,

Jason Rekve
President

Encl.

CC: Jack Staal, Transport Canada



U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION

FORM APPROVED
OMB No. 2120-0018
EXP DATE: 11/30/2013

APPLICATION FOR TYPE CERTIFICATE, PRODUCTION CERTIFICATE, OR SUPPLEMENTAL TYPE
CERTIFICATE

1. Name Of Applicant Aero Design Ltd.		2. Application made for : <input type="checkbox"/> Type Certificate <input type="checkbox"/> Production Certificate <input type="checkbox"/> Supplemental Type Certificate <input type="checkbox"/> Amended Type Certificate <input checked="" type="checkbox"/> Amended Supplemental Type Certificate		3. Product Involved <input checked="" type="checkbox"/> Aircraft <input type="checkbox"/> Engine <input type="checkbox"/> Propeller	
4. Address 9888A Malaspina Road		b. City State Powell River BC, Canada		c. Zip Code V8A 0G3	
5. TYPE CERTIFICATE (Complete item 5a below)					
a. Model designation(s) (All models listed are to be completely described in the required technical data, including drawings representing the design, material, specifications, construction, and performance of the aircraft, aircraft engine, propeller which is the subject of this application.)					
6. PRODUCTION CERTIFICATE (Complete items 6a-c below. Submit with this form, in manual form, one copy of quality control data or changes thereto covering new products, as required by applicable FAR.)					
a. Factory address (if different from above)		b. Application is for <input type="checkbox"/> New production certificate <input type="checkbox"/> Additions to production Certificate (Give P.C. No.)		P.C. No.	
c. Applicant is holder of or a licensee under a Type Certificate or a Supplemental Type Certificate (Attach evidence of licensing agreement and give certificate number)				T.C./S.T.C. No.	
7. SUPPLEMENTAL TYPE CERTIFICATE (Complete items 7a-d below)					
a. Make and model designation of product to be modified Bell 206A, 206B, 206L Series, 407					
b. Description of modification Amend STC SR03283NY - Installation of cyclic stick control friction assembly as a direct replacement for Bell cyclic knob and shaft assembly. Amendment is to add configuration for S/N 254-1657 and update address of holder.					
c. Will data be available for sale or release to other persons? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No		d. Will parts be manufactured for sale? (Ref. FAR 21.303) <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No			
8. CERTIFICATION - I certify that the above statements are true. <input checked="" type="checkbox"/>					
Signature of certifying official 		Title Vice President		Date 13 April 2015	



Transport Canada Transports Canada

DESIGN CHANGE APPROVAL APPLICATION

DEMANDE D'APPROBATION D'UNE MODIFICATION DE LA CONCEPTION

Legal name and address of applicant Nom et adresse légal du demandeur	Legal name and address of prospective holder Nom et adresse légal du titulaire éventuel	Name and address for billing purposes (if different than applicant) Nom et adresse aux fins de facturation (si différent du demandeur)
Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada V8A 0G3	Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada V8A 0G3	

Identification of aeronautical product / Identification du produit aéronautique				
Make / Marque	Model / Modèle	Registration / Immatriculation	Serial No. / N° du série	Part No. / N° de la pièce
Bell	206A/B/L/407	All eligible	All eligible	

Request for (check appropriate box) / Objet de la demande (Cochez les carrés selon le cas)		Type Design Examination by Foreign Authority Examen de la définition de type par autorité étrangère
<input type="checkbox"/> STC CTS	<input type="checkbox"/> Repair Design Approval (RDA) Approbation de la conception de réparation (ACR)	<input checked="" type="checkbox"/> Application to a foreign authority is requested La demande à une autorité étrangère est demandée. <input type="checkbox"/> Type design examination of foreign change Examen de la définition de type modification étrangère Identify Identifier <u>FAA - SR03283NY</u>
<input type="checkbox"/> STC (single serial number) CTS (numéro de série simple)	<input type="checkbox"/> Repair Design Approval - Process Repair ACR - Processus de réparation	
<input type="checkbox"/> STC (multiple serial numbers) CTS (numéros de série multiples)	<input type="checkbox"/> Part Design Approval (PDA) Approbation de la conception de pièce (ACP)	
<input type="checkbox"/> Type Certificate Revision Revision de certificat de type		
<input checked="" type="checkbox"/> Revision Révision No. <u>SH12-59</u>	Current Issue Édition active <u>2</u>	

<input type="checkbox"/> Restricted Category Catégorie restreinte	Type of Operation Type d'opération
--	---------------------------------------

Title and brief description of modification, repair or replacement part, including effects of changes (use additional pages if necessary). Refer to CAR 521.155(b)(i) for details.
Titre et brève description de la modification, de la réparation ou de la pièce de rechange, y compris les effets des changements (utiliser des feuilles supplémentaires si nécessaire).
Référez-vous à RAC 521.155(b)(i) pour des détails.

Installation of cyclic stick control friction assembly as a direct replacement for Bell cyclic knob and shaft assembly.

Applicable Type Certificate (TC) / Certificat de type (CT) pertinent		
TC No. / N° de CT	Issue No. / N° de l'édition	Identify State of Design / Identifier l'état de conception
H-92 (H2SW)	26 (48)	Canada

The applicant is responsible for the control of product manufacture / Le demandeur est responsable du contrôle de la fabrication du produit

<input checked="" type="checkbox"/> Yes Oui	<input type="checkbox"/> No Non	If no, identify who is responsible Si non, identifier qui est responsable
--	------------------------------------	--

Documentation to be submitted Documentation à soumettre	Applicant Demandeur	
	Submitted Soumis	
	Yes Oui	No Non
Proposed certification basis Proposition de base de certification		<input checked="" type="checkbox"/>
Certification plan in accordance with CAR 521.155(d) Plan de certification selon RAC 521.155(d)		<input checked="" type="checkbox"/>

Applicant's remarks / Remarques du demandeur

Amendment is to add configuration for S/N 254-1657 and update address of holder.

I hereby certify that the information contained herein is correct and complete. I agree to pay charges as prescribed in Part 1, Subpart 4 of the CARs (CAR 104-Charges).
Je certifie que les renseignements figurant ci-dessus sont exacts et complets. Je m'engage à payer les redevances prescrites à la sous-partie 4 de la partie I du RAC (sous-partie 104 du RAC - Redevances).

JEFF CLARKE	VICE PRESIDENT	2015-04-13
Name and Signature of Applicant / Nom et signature du demandeur	Title / Poste	Date (yyyy-mm-dd) / Date (aaaa-mm-jj)

4 **Jeff Clarke**

From: Staal, Jack [Jack.Staal@tc.gc.ca]
Sent: January 6, 2015 10:24 AM
To: 'Jeff Clarke'
Subject: RE: C-14-0826, Cyclic Friction revision

Hi Jeff,

Further to items 4 and 5. Section 67-3.

Bell 206A/B Series MM (Bell 206A, B, B3) for serial number 254 and later indicates a ground run (refer to Flight Manual) (hydraulic power implied).

Bell L Series MM's all specify ground run (hydraulic power implied) under adjustment of cyclic friction.

Bell 407 MM friction check must be performed with hydraulic power. (Hydraulic test stand or flight idle).

Only the 206 Series A/B MM for serials prior to 254 provide for control disconnection in the respective MM.

The term breakout or breakaway is not used for S/N 254 through 1657 (A/B series MM).

The term breakout is used for s/n 1658 and subs (A/B series MM)

The term breakaway is used for the L Series.

The term breakout or breakaway is not used for the 407 series except with respect to a Note on page 108 of 67-00-00. The 407 series MM Note cautions against measuring the breakout friction and to use the actual minimum friction.

Wondering if "minimum friction" should be used in lieu of "breakaway/breakout"?

What is the basis for disconnecting the flight controls and not using hydraulic power in the later serial A/B serials and 206L series and 407??

Sincerely,
 Jack

From: Jeff Clarke [<mailto:jeff@aerodesign.ca>]
Sent: Wednesday, December 31, 2014 3:59 PM
To: Staal, Jack
Subject: RE: C-14-0826, Cyclic Friction revision

Hi Jack,

Please see my responses inserted below.

Regards,
 Jeff

From: Staal, Jack [<mailto:Jack.Staal@tc.gc.ca>]
Sent: December 11, 2014 2:01 PM
To: 'Jeff Clarke'
Subject: C-14-0826, Cyclic Friction revision

Hi Jeff, I am awaiting availability of the 206L series documentation on our Bell accessible site. (Should load in a day or so). In the meantime the following observations and comments require some attention.

06/01/2015

1. The CP at 27.29 refers to W&B data specified on instl'n drawing. Did not see any such data on drawing. Should have been indicated as N/A, see original signed CP attached. Corrected in CP at rev. 3 attached.
2. Drawing 95252 has no thread specification(s). Thread is specified in bill of materials, part is fabricated from a bolt as stock. Reference added to drawing to clarify.
3. Regarding the ICA certain early 206's have max pull of .5 to 1 pound. (Ref Bell MM 206A/B). The early S/N (4-253) use a different arrangement with a flange on the shaft instead of differential threads. This installation cannot be applied to those S/N, and we do not intend to make a part that does. The S/N ranges have been updated to remove the early S/N on the drawings and ICA attached.
4. The 407 MM indicates the friction check must be with hydraulic power. ICA refers to " ..controls disconnected or hydraulic power..". This could be misinterpreted. The reason for the hydraulic power test stand is because the un-powered hydraulic system requires significantly more force to move the cyclic stick than when powered. Note the 206L instructions could be read that the adjustment should be performed during a ground run, which is not possible since the seat must be removed to perform the adjustment, and with no friction during the adjustment the rotor could easily move in any direction. Alternatively, disconnecting the flight controls removes the restriction caused by the un-powered hydraulics to allow the correct force measurement.
5. The 407 MM cautions not to measure breakout force. The ICA refers to breakaway force. Again the wording can be confused. I don't see that in my 407 manual (section 67-56). The 206A/B says breakout, 206L/1/3/4 say breakaway. (Section 67-63, page 108 has note regarding "...Do not measure breakout force.")
6. The Bell 206A/B series MM-8 figure 67-10 appears to have serial number configuration breakouts different from the Aero Design documentation. The parts book and the maintenance manual list different ranges. I had the parts book ranges, have changed to the MM ranges.

Jeff I feel section 57-3 of the ICA might benefit from some rewording clarification with possible reference the appropriate MM. I have reworded the section, let me know what you think. The instructions in the original MM are not appropriate as it is setting the position of the barrel nuts (or the shaft in the base for the early configuration), which are now removed.

I don't have the L series MM at hand but some of the relevant comments should be reviewed for those models as well.

Sincerely
Jack Staal

J.H. (Jack) Staal
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Transports Canada | 1100-9700 av. Jasper | Edmonton | Ab T5J-4E6 (RAXI)
Government of Canada | Gouvernement du Canada
To provide feedback to TCCA, use CAIRS.
See: <http://www.tc.gc.ca/CivilAviation/ManagementServices/QA/cairs.htm>
Pour tout commentaire à TCAC, utiliser CAIRS.
Voir: <http://www.tc.gc.ca/AviationCivile/ServicesdeGestion/AQ/ssqac.htm>

06/01/2015

pump may be functionally tested using the following procedures. (Refer to paragraph 29-7, for procedure to test transmission driven hydraulic pump.)

1. Use a hydraulic test stand which is equipped with a 10 micron (390 microinch) filter and a calibrated pressure gage with a range up to 1500 psi (10342 kPa). The test stand must be capable of producing 1500 psi (10342 kPa) at a minimum flow rate of 2.8 gallons per minute (10.6 liters per minute). Clean the stand and service with hydraulic fluid (C-002) prior to use.

2. Inspect the helicopter hydraulic system visually to ensure that all components and lines are attached, cotter pins and lockwire installed and system appears capable of satisfactory operation.

3. Position hydraulic test stand on right side of helicopter near transmission/deck.

4. Remove forward transmission fairing. Disconnect two quick disconnect couplings (3 and 4, figure 29-1). Connect test stand hoses to coupling halves (14 and 15) of two quick disconnects which are attached to filters (5 and 6).

5. Apply electrical power to helicopter. Push HYDR SYSTEM circuit breaker in and position HYDRAULIC SYSTEM switch ON.

6. Set test stand to provide a minimum flow of 2.8 gallons per minute (10.6 liters per minute) with pressure compensator adjusted to 1000 psi (6985 kPa). Apply 1000 psi (6985 kPa) to the hydraulic system and maintain for at least 15 minutes. Accomplish the following checks:

a. While the cyclic and collective controls are being slowly moved, observe the hydraulic servo actuators as they move and check for binding, chafing, and movement of hoses which would tend to loosen fittings.

b. Continue to increase hydraulic test stand pressure slowly while touching relief valve (7, figure 29-1). Determine when the relief valve opens by feel; this should occur at 1075 to 1375 psi (7412 to 9480 kPa). Replace

or overhaul relief valve if it does not open within these limits.

c. Set hydraulic test stand pressure to 1000 ± 25 psi (6895 ± 170 kPa) and position CONTROL BOOST switch to OFF. Move the pilot cyclic and collective controls; they will require more force to move than they did in step a. if solenoid valve (8, figure 29-1) closed as it should have. Position CONTROL BOOST switch ON.

d. Reduce hydraulic test stand pressure to zero, then increase pressure slowly. Move cyclic and collective controls as pressure increases. Change over from mechanical to hydraulic operation should occur at 100 to 188 psi (689 to 1300 kPa). This is a result of action of the three sequence valves (figure 29-2, detail B). Ensure that this requirement is met for the collective, lateral cyclic, and fore-and-aft cyclic controls.

e. Reduce hydraulic test stand pressure to zero. Grasp the rod end of each servo actuator, in turn, and push-pull with approximately 50 pounds (220 newtons) force. The piston rods should not move.

f. Check hydraulic system components for evidence of leaks. (Refer to paragraph 29-3 for additional information on leaks.)

g. Disconnect hydraulic test stand and connect helicopter quick disconnect couplings (3 and 4, figure 29-1). Check hydraulic fluid level in reservoir and replenish if necessary.

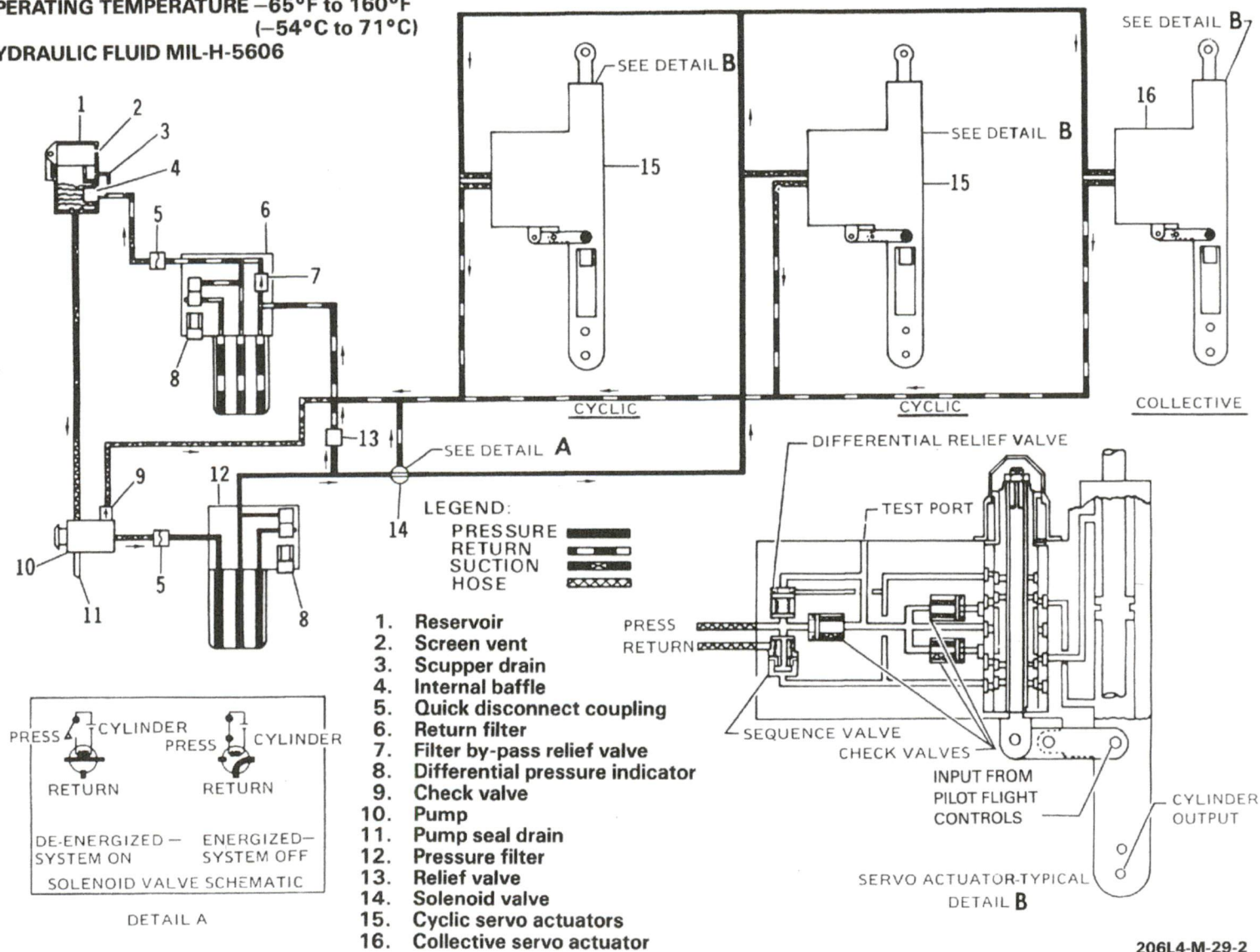
29-7. FUNCTIONAL TEST — HYDRAULIC SYSTEM USING HELICOPTER SYSTEM.

1. If a hydraulic test stand is not available, a functional check of the hydraulic system may be performed using the transmission driven hydraulic pump (10, figure 29-1). This test is less comprehensive than the test described in paragraph 29-6.

2. Inspect helicopter hydraulic system visually to ensure that all components and lines are attached, cotter pins and lockwire installed, and system appears capable of satisfactory operation.

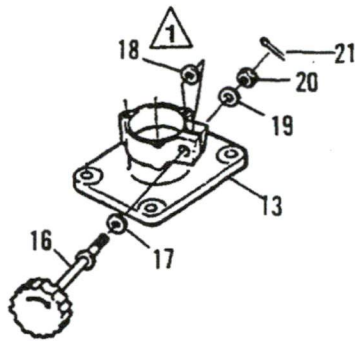
SYSTEM CAPACITY 65 CUBIC INCHES (1100 CUBIC CENTIMETERS)
 RESERVOIR CAPACITY 40.0 CUBIC INCHES (655 CUBIC CENTIMETERS)
 RESERVE CAPACITY 24.3 CUBIC INCHES (398 CUBIC CENTIMETERS)
 OPERATING PRESSURE 1000 PSI (6895 KPa)
 OPERATING TEMPERATURE -65°F to 160°F
 (-54°C to 71°C)
 HYDRAULIC FLUID MIL-H-5606

Figure 29-2. Hydraulic system schematic

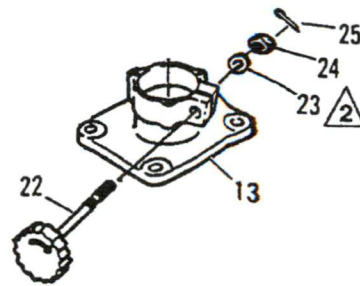


206L4-M-29-2

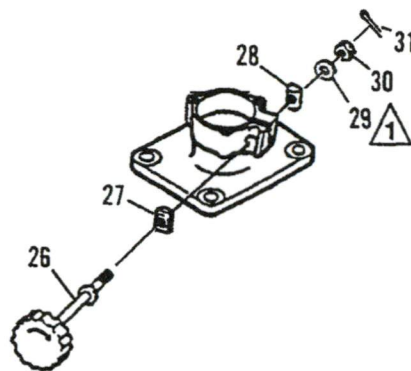
BHT-206L4-MM-4



INSTALLED ON HELICOPTERS S/N 4 THRU 253

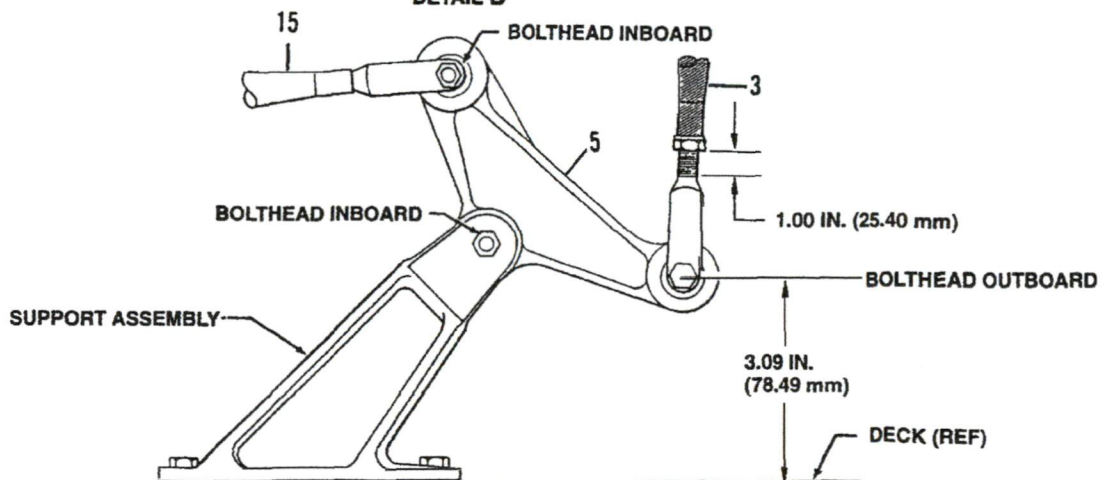


INSTALLED ON HELICOPTERS S/N 254 THRU 1657



INSTALLED ON HELICOPTERS S/N 1658 AND SUBSEQUENT

DETAIL D



DETAIL E

LOOKING INBOARD FROM LEFT SIDE OF CYCLIC CONTROL BELLCRANK AND SUPPORT

206A/BS-M-67-10-2

Figure 67-10. Cyclic control rigging (Sheet 2)

NOTE

Helicopters S/N 414 and subsequent utilize a cyclic stick balance spring eyebolt (in place of the balance spring clip) installed in left (outboard) side of yoke clevis (figure 67-11, view B).

NOTE

Helicopters equipped with cyclic stick balance spring clip may use eyebolt as spares replacement whenever it becomes necessary to replace cyclic stick balance spring clip.

3. Install cyclic stick balance spring on balance spring clip and the other end of spring into eyebolt installed in balance spring bracket.

4. Ground run helicopter (refer to appropriate flight manual); release all friction from pilot cyclic friction adjuster. DO NOT release minimum friction. Increase or decrease tension of balance spring as required to eliminate any tendency for cyclic controls to move fore or aft when cyclic controls are released by pilot.

5. Inspect work area for security of all attaching hardware, interferences, loose tools, etc. Reinstall honeycomb panel and seat cushions; test fly helicopter (refer to appropriate flight manual) and return helicopter to service.

67-39. CYCLIC FRICTION ADJUSTMENT.

A knob and shaft assembly is installed in the pivot support assembly to support a friction lock for the cyclic control stick. The knob and shaft assembly is turned clockwise or counterclockwise to increase or decrease the force required to move the cyclic control stick.

1. Remove pilot seat cushion and seat support.
2. Disconnect yoke (9, figure 67-10) (paragraph 67-54) and torque tube (10) (paragraph 67-41) from the pivot assembly.
3. On helicopters S/N 4 through 253 (equipped with cyclic friction support as shown in figure 67-10, detail D), adjust minimum cyclic friction as follows, boost off.

NOTE

Ensure washer (17) and spacer (18) are in place on friction knob (16).

a. Position cyclic control stick (12) in neutral position. Adjust friction knob (16) until force of 0.5 to 1.0 pound (2.22 to 4.44 N), measured on a spring scale applied at center of grip, is required to move the cyclic stick forward.

b. Install shim (18) and nut (20) on friction knob (16). Use shims (18) as required between nut (20) and pivot support (13) to maintain friction as required in step 3.a. Once friction requirement is met install cotter pin (21).

c. Connect yoke (9) (paragraph 67-56) and torque tube (10) (paragraph 67-43) to pivot assembly.

d. Install pilot seat support and cushion:

4. On helicopters S/N 254 through 1657 (equipped with cyclic friction support as shown in figure 67-10, detail D), adjust minimum cyclic friction as follows:

a. During ground run, position cyclic control stick (12) in neutral position. Adjust friction knob (22) until a force of 0.5 to 1.5 pounds (2.22 to 6.67 N), measured on a spring scale applied at center of grip, is required to move the cyclic control stick forward.

b. Shim with washers (23), install washer (23), and nut (24) as required to maintain friction set in step 3.a. Once friction requirement is met, install cotter pin (25).

5. On helicopters S/N 1658 and subsequent (equipped with cyclic friction support as shown in figure 67-10, detail D), adjust minimum cyclic friction as follows:

a. During ground run, position cyclic control stick (12) in neutral position and, using a spring scale, check for a breakout force of 0.5 to 1.5 pounds (2.22 to 6.67 N) measured at center of grip.

b. If adjustment is required, remove knob and shaft (26) from pivot support (13). Assemble and adjust as follows:

(1) Hold large and small barrel nuts (27 and 28) to slots on pivot support (13). Thread friction knob and shaft (26) through large barrel nut, pivot support, and small barrel nut until large threads on knob and shaft contact the large barrel nut. Hold the large barrel nut approximately 0.030 inch (0.76 mm) from pivot support and thread knob and shaft into the large barrel nut until it is pulled into contact with pivot support.

(2) Ground run helicopter and accomplish step 5.a., tightening friction knob and shaft (26) into barrel nuts (27 and 28) and pivot support (13) until required breakout force is obtained.

(3) Hold friction knob and shaft (26) stationary and install aluminum washers (8 maximum) (29), as required, nut (30), and cotter pin (31). Check breakout force with knob and shaft loosened. Breakout force must be maintained.

11. Adjust control tubes (16 and 17) to fit. Torque jam nuts 80 to 100 inch-pounds.

NOTE: Control tubes (16 and 17) should be approximately equal in length.

12. Connect control tubes (16 and 17) to swashplate (18) with bolt, two washers and nut. Torque nut 60 to 85 inch-pounds plus friction drag, and install cotter pin.

13. Remove (T102019) rigging tool from servo actuators (10 and 11).

14. Check adjustment of cyclic stick balance spring in accordance with paragraph 27-27.

15. Coat threads of all adjustable rod-end bearings and fittings on control tubes with corrosion preventive compound (item 410).

16. To assure clearance between cyclic yoke (5D, figure 27-1) and elevator control tube (5C), apply hydraulic pressure to the boost actuators by means of an auxiliary hydraulic power cart. Position the collective stick in its full up position and check clearance between the yoke and the elevator tube as the cyclic stick is moved to its full forward and forward corner positions. If parts make contact, shorten collective control tube (5) to provide 0.020 to 0.040 inch clearance at the most critical stick position, then shorten cyclic control tube (5A and 5B) by the same amount as collective control tube (5).

NOTE: Perform clearance check between swashplate inner ring and pivot sleeve after rigging collective and cyclic controls.

16A. To assure clearance between swashplate inner ring and pivot sleeve, apply hydraulic pressure to the servo actuators by means of an auxiliary hydraulic power cart. Position the cyclic control stick to extreme control positions. If contact between the inner ring and pivot sleeve is made on aft side, shorten control tubes (9) the same amount to obtain 0.010 to 0.030 inch clearance. If contact between the inner ring and pivot sleeve is made on forward side, lengthen control tubes (9) the same amount to obtain 0.010 to 0.030 inch clearance on forward side of sleeve or until the minimum clearance on aft side is reduced to 0.010 inch.

17. Check cyclic controls to ensure that all safety devices (cotter pins and lockwire) are installed. Check controls for freedom of operation without binding or interference.

27-27. ADJUSTMENT — CYCLIC STICK BALANCE SPRING.

NOTE: The balance spring (5, figure 27-5) is used in the system to minimize the cyclic stick mass imbalance forces and elevator induced forces in the longitudinal control system.

1. Place cyclic stick in the extreme aft position against stick stop (figure 27-5, Detail E).

2. Adjust eyebolt (29) to obtain balance spring length of 4.90 for single controls or 6.18 for dual controls (figure 27-5, Detail E). Secure with jamnut.

27-27A. ADJUSTMENT CYCLIC FRICTION.

At the time of ground run of ship, adjust friction knob (1, figure 27-5) until a spring scale applied at center of grip indicates a breakaway force of 1.0 lb. \pm 0.5 lb., torque nut (27) finger tight and secure. A maximum of 8 washers may be used to position nut in line with cotter pin hole in shaft.

27-28. CYCLIC STICK AND TORQUE TUBE.

The cyclic stick extends upward and forward from the front of the pilot's seat. Switches are installed on the stick grip for the intercom system and radio. The torque tube connects to the cyclic stick support and provides a mounting point for the elevator controls. (See figure 27-6.)

27-29. REMOVAL — CYCLIC STICK AND TORQUE TUBE.

1. Remove access panels as required.

2. Remove cyclic stick (3, figure 27-6) as follows:

a. Disconnect electrical connector at bottom of stick.

b. Remove screws (1) and slide boot (2) upward on cyclic stick (3).

c. Remove nuts (4), washers (5 and 7) and bolts (8) from lever assembly (6).

d. Remove cyclic stick (3) from lever assembly (6) and boot (2). Guide electrical cable through lever assembly as stick is removed.

3. Remove torque tube (26) as follows:

a. Remove bolt, washers, and nut (54) to disconnect elevator control tubes (55) from eyebolt (53). (See figure 27-6, detail A.)

1. Place cyclic stick in the extreme aft position against stick stop (detail B).

2. Adjust eyebolt (6) to obtain balance spring length of 4.90 for single controls or 6.18 for dual controls (detail B). Secure with jamnut.

27-28. ADJUSTMENT — CYCLIC FRICTION.

At the time of ground run of helicopter, adjust cyclic friction knob until a spring scale, applied at center of grip, indicates a breakaway force of 1.0 lb. \pm 0.5 lb., tighten nut (10, figure 27-8) fingertight and secure. A maximum of eight washers may be used to position nut in line with cotter pin hole in shaft.

27-29. CYCLIC STICK AND TORQUE TUBE.

The cyclic stick extends upward and forward from the front of the pilots seat. Switches are installed on the stick grip for the intercom system and radio. The torque tube connects to the cyclic stick support and provides a mounting point for the elevator controls.

27-30. REMOVAL — CYCLIC STICK AND TORQUE TUBE.

1. Remove access panels as required.
2. Remove cyclic stick (27, figure 27-8) as follows:
 - a. Disconnect electrical connector at bottom of stick.
 - b. Remove screws (25) and slide boot (26) upward on cyclic stick (27).
 - c. Remove nuts (1), aluminum washers (2 and 23) and bolts (22) from lever assembly (24).
 - d. Remove cyclic stick (27) from lever assembly (24) and boot (26). Guide electrical cable through lever assembly as stick is removed.
3. Remove torque tube (48) as follows:
 - a. Remove bolt, washers, nut, and cotter pin (45) to disconnect elevator torque tubes (44) from eyebolt (46).
 - b. Remove nut (52), washers (53 and 54), and bolt (55).

c. Remove nut (35), washers (33 and 34), and bolt (32).

d. Remove torque tube (48).

e. If torque tube is to be replaced, remove nut (51), washer (50), spacers (47), bushing (49), and eyebolt (46).

4. Remove nut (6), washers (4), special washers (7), and bolt (3) to separate right yoke (5) from lever assembly (24).

5. Remove nut (10), aluminum washers (11), and barrel nut (12). Remove knob and shaft (18) and boot (26).

CAUTION: DO NOT SPREAD SLOT OR REMOVE OUTER RACE FROM SPLIT FRICTION BEARING (8). DAMAGE TO BEARING OR SUPPORT MAY OCCUR.

6. Remove three screws (21) from retainer (9) and pivot support (13). Lift lever assembly (24), retainer (9), and split friction bearing (8) from pivot support (13).

7. Remove bolts (20), aluminum washers (19), and remove pivot support (13).

8. Remove screws (16) and special washers (15) to remove cover (14) from bottom of cabin floor.

9. Remove spring (7, figure 27-7) from eyebolt (30, figure 27-8). Remove nut (31), washer (28), and eyebolt (30) to separate left yoke (29) from lever assembly (36).

10. Remove nut (42), washers (40 and 43), and bolt (39) to remove lever assembly (36).

11. Remove bolts (37) and washers (38) to remove pivot support (41).

27-31. INSPECTION AND REPAIR — CYCLIC STICK AND TORQUE TUBE.

1. Inspect and repair control tubes. (Refer to paragraph 27-3.)
2. Inspect and repair bellcranks, levers, and supports. (Refer to paragraph 27-5.)
3. Inspect split friction bearing (4, figure 27-9) for roughness.

11. Connect control tubes (2) to swashplate (1) with bolt, two washers and nut. Torque nut 60 to 85 inch-pounds (6.78 to 9.60 newton-meters) and install cotter pin.

12. Remove T102019 rigging tool from servo actuators (14).

13. Check adjustment of cyclic stick balance spring (paragraph 67-39).

14. Coat threads of all adjustable rod end bearings and fittings on control tubes with corrosion preventive compound (C-101).

15. Check rigging of elevator controls (paragraph 67-80).

16. Ensure clearance between cyclic yoke (8, figure 67-6) and elevator control tube (2). Apply hydraulic pressure to the servo actuators by means of an auxiliary hydraulic power cart. Position the collective stick in its full up position and check clearance between the yoke and the elevator tube as the cyclic stick is moved to its full forward and forward corner positions. If these parts make contact, shorten collective control tube (8, figure 67-2) to provide 0.020 to 0.040 inch (0.508 to 1.02 mm) clearance at the most critical stick position, then shorten cyclic control tubes (17, figure 67-9) by the same amount as the collective control tube (8, figure 67-2).

NOTE

Perform clearance check between swashplate inner ring and pivot sleeve after rigging collective and cyclic controls.

17. Ensure clearance between swashplate inner ring and pivot sleeve. Apply hydraulic pressure to the servo actuators by means of an auxiliary hydraulic power cart. Position the cyclic control stick to extreme control positions. If contact between the inner ring and pivot sleeve is made on aft side, shorten control tubes (2) the same amount to obtain 0.010 to 0.030 inch (0.254 to 0.762 mm) clearance. If contact between the inner ring and pivot sleeve is made on forward side, lengthen control tubes (2) the same amount to obtain 0.010 to 0.030 inch (0.254 to 0.762

mm) clearance on forward side of sleeve, or until the minimum clearance on aft side is reduced to 0.010 inch (0.254 mm).

18. Check cyclic controls to ensure that all safety devices (cotter pins and lockwire) are installed. Check controls for freedom of operation without binding or interference.

67-39. CYCLIC STICK BALANCE SPRING.

NOTE

The balance spring (7, figure 67-9) is used in the system to minimize the cyclic stick mass imbalance forces and elevator induced forces in the longitudinal control system.

1. Place cyclic stick in the extreme aft position against stick stop.

2. Adjust eyebolt (6) to obtain balance spring length of 4.90 inches (124 mm) for single controls, or 6.18 inches (157 mm) for dual controls (detail B). Secure with jamnut.

67-40. CYCLIC FRICTION ADJUSTMENT.

At the time of ground run of helicopter, adjust cyclic friction knob until a spring scale, applied at center of grip, indicates a breakaway force of 1.0 ± 0.5 pounds (4.4 ± 2.2 newtons) tighten nut (10, figure 67-10) finger tight and secure. A maximum of eight washers may be used to position nut in line with cotter pin hole in shaft.

67-41. CYCLIC STICK AND TORQUE TUBE.

The cyclic stick extends upward and forward from the front of the pilot seat. Switches are installed on the stick grip for the intercom system and radio. The torque tube connects to the cyclic stick support and provides a mounting point for the elevator controls.

BHT-206L4-MM-8

single controls, or 6.18 inches (157 mm) for dual controls (detail B). Secure with jamnut.

**67-40. CYCLIC FRICTION
ADJUSTMENT.**

At the time of ground run of helicopter, adjust cyclic friction knob until a spring scale,

applied at center of grip, indicates a breakaway force of 1.0 ± 0.5 pounds (4.4 ± 2.2 newtons). Tighten nut (10, figure 67-10) finger tight and secure. A maximum of eight washers may be used to position nut in line with cotter pin hole in shaft.

67-56. CYCLIC FRICTION ADJUSTMENT — MINIMUM FRICTION

1. Connect the hydraulic test stand to the helicopter and turn it on.
2. Adjust the cyclic friction knob (4, Figure 67-10) (Detail J) until a spring scale that is attached to the centre of the cyclic control stick grip (2) shows that a force of 0.5 to 1.5 LBS (0.227 to 0.681 Kg) will move the cyclic control stick (1).
3. After the friction knob (4) is set, tighten the nut (48) by hand (Detail J).

NOTE

You may add a maximum of six washers to align the castellation of the nut for the cotter pin.

4. Safety the nut (48) with a cotter pin (50).
5. Turn off the hydraulic test stand and disconnect it from the helicopter.

67-57. PILOT CYCLIC CONTROL STICK AND GRIP ASSEMBLY

The cyclic control stick extends up and forward from the front of the pilot seat. It is used to put the rotor disk of the main rotor at different angles as the cyclic control stick is moved. The grip is installed on the top end of the cyclic control stick. The grip has switches installed on it for the intercom system, the radio and has provisions for a cargo release and for other kits.

67-58. PILOT CYCLIC CONTROL STICK AND GRIP ASSEMBLY — REMOVAL

1. Remove the pilot seat (Chapter 25).
2. Remove the pilot seat panel assembly.
3. Disconnect the electrical connector at the bottom of the cyclic control stick (1, Figure 67-12).
4. Remove the screws (2) and move the boot assembly (3) up the cyclic control stick (1).

5. Remove the nut (4), washers (5 and 6), spacer (7) and bolt (8) that connect the tube assembly (9) to the pivot assembly (14).

6. Remove the bolt (10), washers (11) and nut (12) that connect the torque tube assembly (13) to the pivot assembly (14). The lateral balance spring (28) will be disconnected as a result of this.

7. Remove the screws (15) and washers (16) that attach the retainer (17) to the pivot support assembly (18).

8. Turn the knob and shaft (19) counterclockwise to loosen the pivot support assembly (18).

CAUTION

DO NOT OPEN THE SLOT OR REMOVE THE OUTER RACE FROM THE SPLIT FRICTION BEARING. IF YOU DO NOT FOLLOW THIS INSTRUCTION, YOU CAN CAUSE DAMAGE TO THE BEARING OR SUPPORT.

9. Remove the pilot cyclic control stick (1) and pivot assembly (14).

10. Remove the screws (20) and washers (21) and cover (22) from the bottom of the flight compartment floor.

11. Remove the bolts (23), washers (24) and pivot support assembly (18).

67-59. PILOT CYCLIC CONTROL STICK AND GRIP ASSEMBLY — INSPECTION AND REPAIR

1. Examine the cyclic control stick (1, Figure 67-12) (Chapter 5).

2. Examine the pivot assembly (14) and the attachments for any cracks or corrosion. Refer to BHT-407-CR&O for the damage limits.

3. Examine the pivot support (18) for any crack or corrosion. Refer to BHT-407-CR&O for the damage limits.

Jeff Clarke**From:** Staal, Jack [Jack.Staal@tc.gc.ca]**Sent:** December 11, 2014 2:01 PM**To:** 'Jeff Clarke'**Subject:** C-14-0826, Cyclic Friction revision

Hi Jeff, I am awaiting availability of the 206L series documentation on our Bell accessible site. (Should load in a day or so). In the meantime the following observations and comments require some attention.

1. The CP at 27.29 refers to W&B data specified on instl'n drawing. Did not see any such data on drawing. *Removed*
2. Drawing 95252 has no thread specification(s). *Not shown in BOM, ref. added*
3. Regarding the ICA certain early 206's have max pull of .5 to 1 pound. (Ref Bell MM 206A/B)
4. The 407 MM indicates the friction check must be with hydraulic power. ICA refers to " ..controls disconnected or hydraulic power..". This could be misinterpreted.
5. The 407 MM cautions not to measure breakout force. The ICA refers to breakaway force. Again the wording can be confused. *→ where? that is what is being measured → force required to move stick*
6. The Bell 206A/B series MM-8 figure 67-10 appears to have serial number configuration breakouts different from the Aero Design documentation. *MM says 1657 / ICA says 1651, changed to 1657*

Jeff I feel section 57-3 of the ICA might benefit from some rewording clarification with possible reference the appropriate MM.

I don't have the L series MM at hand but some of the relevant comments should be reviewed for those models as well.

Sincerely
Jack Staal

J.H. (Jack) Staal

Aircraft Certification Technologist | Technologue, Certification des aeronefs.

Engineering | Ingénierie

Prairie and Northern Region | Region des Prairies et du Nord

Edmonton Operations | Edmonton opérations

(780)495-5227 | **Facs/ telec: (780)495-6659 (note recent fax change)**

jack.staal@tc.gc.ca

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Transports Canada | 1100-9700 av. Jasper | Edmonton | Ab T5J-4E6 (RAXI)

Government of Canada | Gouvernement du Canada

To provide feedback to TCCA, use CAIRS.

See: <http://www.tc.gc.ca/CivilAviation/ManagementServices/QA/cairs.htm>

Pour tout commentaire à TCAC, utiliser CAIRS.

Voir: <http://www.tc.gc.ca/AviationCivile/ServicesdeGestion/AQ/ssqac.htm>

11/12/2014



DECLARATION OF CONFORMITY WITH THE CERTIFICATION BASIS

In accordance with Canadian Aviation Regulations Subpart 521, I hereby declare that the design of the Cyclic Friction Replacement, as detailed in the data approved by Transport Canada on approval SH12-59, Issue 2, has been demonstrated to conform to the best of my knowledge to the basis of certification established by the Minister for that approval in file C-14-0826.

Aero Design Ltd.

per: _____


Signature

Jeff Clarke

Print Name

Vice President

Title

02 September 2014

Date



SIGNED UNDERTAKING

In accordance with CAR 521 Aero Design Ltd. hereby

Company to hold the approval document(s):

undertake to carry out the responsibilities of a design approval document holder, as set out in Division VIII of Part V, Subpart 21 of the CARs, regarding:

1. Technical capability,
2. Service difficulty reporting,
3. Establishing a service difficult reporting system,
4. Investigation of service difficulty reports,
5. Mandatory changes,
6. Transfers,
7. Record keeping and loss or disposal of records,
8. Manuals,
9. Instructions for continued airworthiness, and
10. Supplemental integrity instructions

The responsibilities noted above are with reference to the data which may be found with one or more of the following numbers:

Transport Canada file number: C-14-0826


and / or

Project Reference number: 952

and / or

Approval Number: SH12-59, Issue 2

X


Signature of Holder's authorized person:

02 September 2014

Date:

Vice President

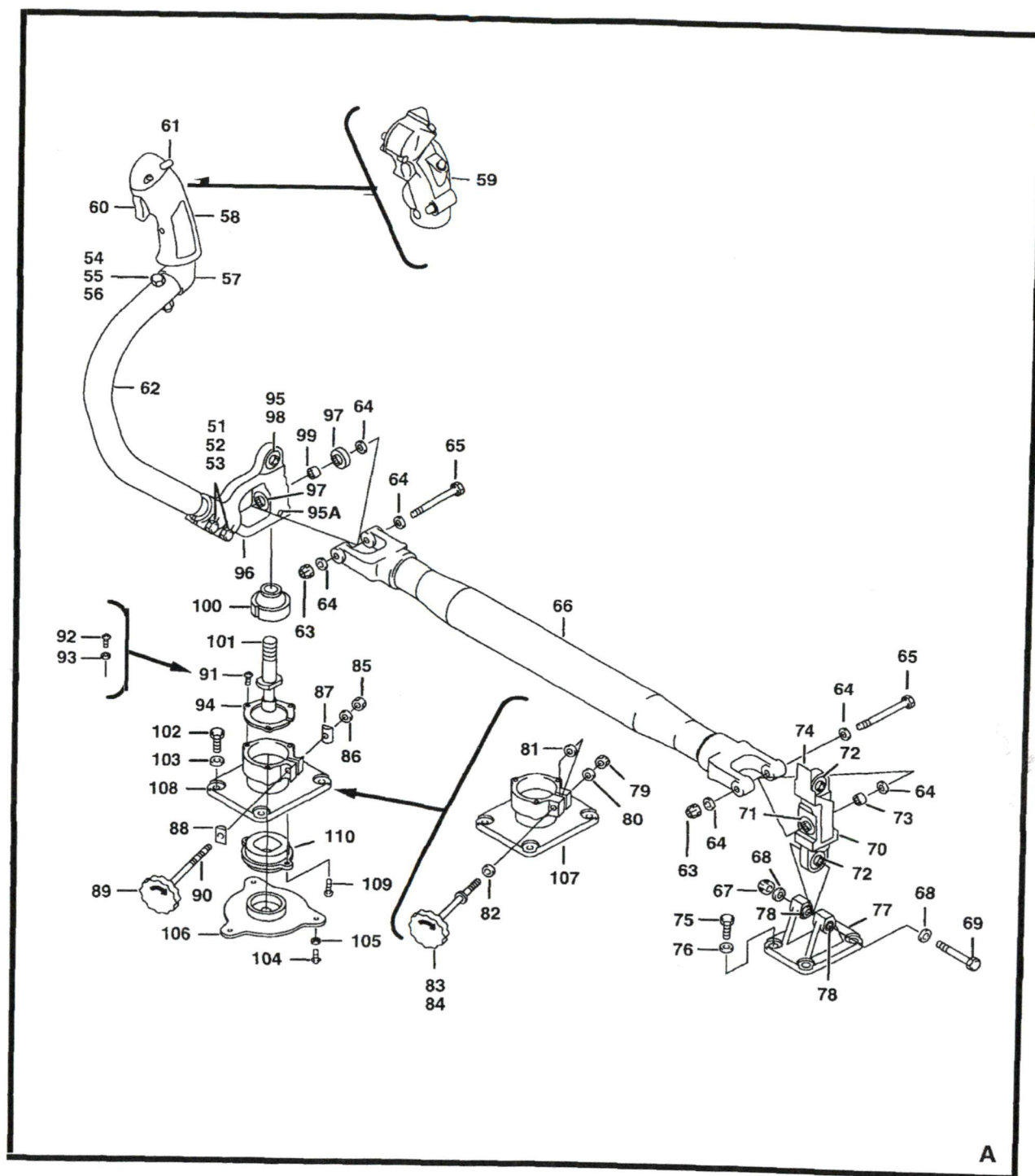
Position / Title:



DESIGN CHANGE APPROVAL APPLICATION

DEMANDE D'APPROBATION D'UNE MODIFICATION DE LA CONCEPTION

Legal name and address of applicant Nom et adresse légale du demandeur		Legal name and address of prospective holder Nom et adresse légale du titulaire éventuel		Name and address for billing purposes (if different than applicant) Nom et adresse aux fins de facturation (si différent du demandeur)	
Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada V8A 0G3		Aero Design Ltd. 9888A Malaspina Road Powell River, BC, Canada V8A 0G3			
Identification of aeronautical product / Identification du produit aéronautique					
Make / Marque Bell		Model / Modèle 206A, B, L, 407	Registration / Immatriculation All eligible	Serial No. / N° du série All eligible	Part No. / N° de la pièce
Request for (check appropriate box) / Objet de la demande (Cochez les carrés selon le cas)				Type Design Examination by Foreign Authority Examen de la définition de type par autorité étrangère	
<input type="checkbox"/> STC CTS <input type="checkbox"/> STC (single serial number) CTS (numéro de série simple) <input type="checkbox"/> STC (multiple serial numbers) CTS (numéros de série multiples) <input type="checkbox"/> Type Certificate Revision Revision de certificat de type <input checked="" type="checkbox"/> Revision Révision No. N° SH12-59 Current Issue Édition active 1				<input type="checkbox"/> Repair Design Approval (RDA) Approbation de la conception de réparation (ACR) <input type="checkbox"/> Repair Design Approval - Process Repair ACR - Processus de réparation <input type="checkbox"/> Part Design Approval (PDA) Approbation de la conception de pièce (ACP) <input type="checkbox"/> Application to a foreign authority is requested La demande à une autorité étrangère est demandée. <input type="checkbox"/> Type design examination of foreign change Examen de la définition de type modification étrangère Identify Identifier	
<input type="checkbox"/> Restricted Category Catégorie restreinte Type of Operation Type d'opération					
Title and brief description of modification, repair or replacement part, including effects of changes (use additional pages if necessary). Refer to CAR 521.155(b)(i) for details. Titre et brève description de la modification, de la réparation ou de la pièce de rechange, y compris les effets des changements (utiliser des feuilles supplémentaires si nécessaire). Référez-vous à RAC 521.155(b)(i) pour des détails. Installation of Cyclic Stick Control Friction as a Direct Replacement for Bell Cyclic Knob and Shaft Assembly.					
Applicable Type Certificate (TC) / Certificat de type (CT) pertinent					
TC No. / N° de CT H-92		Issue No. / N° de l'édition 26		Identify State of Design / Identifier l'état de conception Canada	
The applicant is responsible for the control of product manufacture / Le demandeur est responsable du contrôle de la fabrication du produit					
<input checked="" type="checkbox"/> Yes Oui <input type="checkbox"/> No Non If no, identify who is responsible Si non, identifier qui est responsable					
Documentation to be submitted Documentation à soumettre				Applicant Demandeur	
				Submitted Soumis	
Proposed certification basis Proposition de base de certification				Yes Oui	No Non
				✓	
Certification plan in accordance with CAR 521.155(d) Plan de certification selon RAC 521.155(d)				✓	
Applicant's remarks / Remarques du demandeur Reissue is to update holder information and minor changes identified in the certification plan.					
I hereby certify that the information contained herein is correct and complete. I agree to pay charges as prescribed in Part 1, Subpart 4 of the CARs (CAR 104-Charges). Je certifie que les renseignements figurant ci-dessus sont exacts et complets. Je m'engage à payer les redevances prescrites à la sous-partie 4 de la partie I du RAC (sous-partie 104 du RAC - Redevances).					
Name and Signature of Applicant / Nom et signature du demandeur Jeff Clarke		Title / Poste VICE PRESIDENT		Date (yyyy-mm-dd) / Date (aaaa-mm-jj) 2014-08-07	

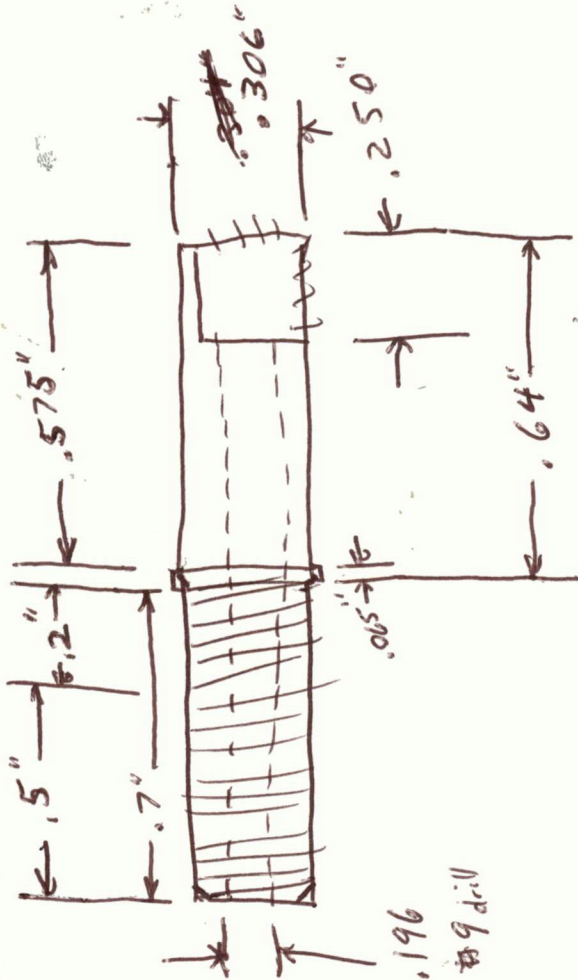


206A/B/B3-67-1005-2
C0000

Figure 67-5. Controls installation, cyclic (Sheet 2)

Rev. 2 67-99-00
Page 31

FOR BEST VALUE, BUY GENUINE BELL PARTS



(1) INDEX NUMBER	(2) PART NUMBER	(3) ITEM NAME	(4) UNIT PER ASSY	(5) A V A I L	(6) U O C
		FIGURE: 67-5. Controls installation, cyclic (Cont'd)			
107	206-001-360-001	.PIVOT SUPPORT ASSY	1		C
107	206-001-360-005	.PIVOT SUPPORT ASSY	1		L
108	206-001-397-001	.SUPPORT ASSY, PIVOT (REPLACED BY 206-001-397-101)	1		U
108	206-001-397-101	.SUPPORT ASSY, PIVOT (REPLACES 206-001-397-001) . .	1	1	U
109	AN503-6-6	..SCREW	2	1	
110	206-001-328-007	..SLEEVE	1	1	
		NOTE 1: LENGTH IS -22 OR -23 TO BE DETERMINED ON INSTALLATION.			
		USABLE ON CODES			
		CODE MODEL SERIAL NUMBER			
		A 206A 4-103			
		B 206A 4-153			
		C 206A 4-203			
		D 206A 4-583			
		E 206A 104-153			
		F 206A/B 4-1413			
		G 206A/B 4-1662			
		H 206A/B 4-2211			
		J 206A/B 304-1413			
		K 206A/B 584-1413			
		L 206A/B 204-1630, 1632-1651			
		M 206A/B/BIII 4-2622			
		N 206A/B/BIII 4-3566			
		P 206A/B/BIII 4-583, 1414-SUB			
		Q 206A/B/BIII 154-SUB			
		R 206A/B/BIII 204-SUB			
		S 206A/B/BIII 304-SUB			
		T 206A/B/BIII 584-SUB			
		U 206B/BIII 1631, 1652-SUB			
		V 206B/BIII 1414-SUB			
		W 206B/BIII 1663-SUB			
		X 206BIII 2212-SUB			
		Y 206BIII 2623-SUB			
		Z 206BIII 3567-SUB			
		1) UNLESS A USABLE ON PART NUMBER IS LISTED IN THE ITEM NAME COLUMN; NO CODE INDICATES THE PART APPLIES TO ALL SERIAL NUMBERS.			
		2) IF THE SERIAL NUMBER IS BLANK THE PART APPLIES TO ALL SERIAL NUMBERS FOR THAT MODEL.			

11. Connect control tubes (2) to swashplate (1) with bolt, two washers and nut. Torque nut 60 to 85 inch-pounds (6.78 to 9.60 newton-meters) and install cotter pin.

12. Remove T102019 rigging tool from servo actuators (14).

13. Check adjustment of cyclic stick balance spring (paragraph 67-39).

14. Coat threads of all adjustable rod end bearings and fittings on control tubes with corrosion preventive compound (C-101).

15. Check rigging of elevator controls (paragraph 67-80).

16. Ensure clearance between cyclic yoke (8, figure 67-6) and elevator control tube (2). Apply hydraulic pressure to the servo actuators by means of an auxiliary hydraulic power cart. Position the collective stick in its full up position and check clearance between the yoke and the elevator tube as the cyclic stick is moved to its full forward and forward corner positions. If these parts make contact, shorten collective control tube (8, figure 67-2) to provide 0.020 to 0.040 inch (0.508 to 1.02 mm) clearance at the most critical stick position, then shorten cyclic control tubes (17, figure 67-9) by the same amount as the collective control tube (8, figure 67-2).

NOTE

Perform clearance check between swashplate inner ring and pivot sleeve after rigging collective and cyclic controls.

17. Ensure clearance between swashplate inner ring and pivot sleeve. Apply hydraulic pressure to the servo actuators by means of an auxiliary hydraulic power cart. Position the cyclic control stick to extreme control positions. If contact between the inner ring and pivot sleeve is made on aft side, shorten control tubes (2) the same amount to obtain 0.010 to 0.030 inch (0.254 to 0.762 mm) clearance. If contact between the inner ring and pivot sleeve is made on forward side, lengthen control tubes (2) the same amount to obtain 0.010 to 0.030 inch (0.254 to 0.762

mm) clearance on forward side of sleeve, or until the minimum clearance on aft side is reduced to 0.010 inch (0.254 mm).

18. Check cyclic controls to ensure that all safety devices (cotter pins and lockwire) are installed. Check controls for freedom of operation without binding or interference.

67-39. CYCLIC STICK BALANCE SPRING.

NOTE

The balance spring (7, figure 67-9) is used in the system to minimize the cyclic stick mass imbalance forces and elevator induced forces in the longitudinal control system.

1. Place cyclic stick in the extreme aft position against stick stop.

2. Adjust eyebolt (6) to obtain balance spring length of 4.90 inches (124 mm) for single controls, or 6.18 inches (157 mm) for dual controls (detail B). Secure with jamnut.

67-40. CYCLIC FRICTION ADJUSTMENT.

At the time of ground run of helicopter, adjust cyclic friction knob until a spring scale, applied at center of grip, indicates a breakaway force of 1.0 ± 0.5 pounds (4.4 ± 2.2 newtons) tighten nut (10, figure 67-10) finger tight and secure. A maximum of eight washers may be used to position nut in line with cotter pin hole in shaft.

67-41. CYCLIC STICK AND TORQUE TUBE.

The cyclic stick extends upward and forward from the front of the pilot seat. Switches are installed on the stick grip for the intercom system and radio. The torque tube connects to the cyclic stick support and provides a mounting point for the elevator controls.

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

APPENDIX A-3 NORMAL CATEGORY ROTORCRAFT – CAR 527

BLOCK 1

Name of the applicant for the design change approval:	Aero Design Ltd.
Description of the design change:	Installation of Cyclic Friction Replacement on Bell 206A, 206B, 206L Series, 407
Certification Basis of design change and revision date:	FAR 27, Amendment 27-44
CAR Standard A527.1(c) Program showing how changes to supplemental ICA made by the applicant or by the manufacturers of products and appliances installed in the aeroplane pursuant to the design change will be distributed:	Section 0-3 of Supplemental ICA (ICA 952.90)
CAR Standard 513.05 (1) (g) (iv): Installation Instructions:	Installation Drawing 95201, 95202

BLOCK 2

Note: Enter "N/A" when no supplemental ICA are needed.

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.2 (a) Manual(s) (a) The Instructions for Continued Airworthiness must be in the form of a manual or manuals as appropriate for the quantity of data to be provided.	ICA ref: Bell 206/407 Maintenance Manuals: BHT-206A/B-MM / BHT-206L-MM / BHT-407-MM	Supplemental ICA ref: Single Manual (ICA952.90)
A527.2 (b) Practical arrangement (b) The format of the manual or manuals must provide for a practical arrangement.	ICA ref: Bell 206A/206B/206L/407 Maintenance Manuals	Supplemental ICA ref: Arranged in ATA format
A527.3 The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information:		
A527.3 (a) Rotorcraft maintenance manual or section		
A527.3 (a) (1) (Introduction) (1) Introduction information that includes an explanation of the rotorcraft's features and data to the extent necessary for maintenance or preventive maintenance.	ICA ref: Bell 206A/206B/206L/407 Maintenance Manual, Chapter 1	Supplemental ICA ref: Section 0-1
A527.3 (a) (2) (Description) (2) A description of the rotorcraft and its systems and installations including its engines, rotors, and appliances.	ICA ref: Bell 206A/206B/206L/407 Maintenance Manual, Chapter 1	Supplemental ICA ref: Section 0-5

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.3 (a) (3) Control & Operation (3) Basic control and operation information describing how the rotorcraft components and systems are controlled and how they operate, including any special procedures and limitations that apply.	ICA ref: N/A	Supplemental ICA ref: Section 67-4
A527.3 (a) (4) Servicing (4) Servicing information that covers details regarding servicing points, capacities of tanks, reservoirs, types of fluids to be used, pressures applicable to the various systems, location of access panels for inspection and servicing, locations of lubrication points, lubricants to be used, equipment required for servicing, tow instructions and limitations, mooring, jacking, and levelling information.	ICA ref: Bell 206A/206B/206L/407 Maintenance Manual, Chapter 12	Supplemental ICA ref: N/A
A527.3 <i>The Instructions for Continued Airworthiness must contain the following manuals or sections, as appropriate, and information:</i>		
A527.3 (b) Maintenance Instructions.		
A527.3 (b) (1) Scheduling 1) Scheduling information for each part of the rotorcraft and its engines, auxiliary power units, rotors, accessories, instruments, and equipment that provides the recommended periods at which they should be cleaned, inspected, adjusted, tested, and lubricated, and the degree of inspection, the applicable wear tolerances, and work recommended at these periods. However, the applicant may refer to an accessory, instrument, or equipment manufacturer as the source of this information if the applicant shows that the item has an exceptionally high degree of complexity requiring specialized maintenance techniques, test equipment, or expertise. The recommended overhaul periods and necessary cross-references to the Airworthiness Limitations section of the manual must also be included. In addition, the applicant must include an inspection program that includes the frequency and extent of the inspections necessary to provide for the continued airworthiness of the rotorcraft.	ICA ref: Bell 206A/206B/206L/407 Maintenance Manual, Chapter 5	Supplemental ICA ref: Section 5-1
A527.3 (b) (2) Troubleshooting (2) Troubleshooting information describing probable malfunctions, how to recognize those malfunctions, and the remedial action for those malfunctions.	ICA ref: N/A	Supplemental ICA ref: N/A

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

Regulatory Standard Reference Column 1	Design Approval Holder (DAH) ICA Reference Column 2	Applicant Means of Compliance Supplemental ICA Requirements Column 3
A527.3 (b) (3) Removal/replacement (3) Information describing the order and method of removing and replacing products and parts with any necessary precautions to be taken.	ICA ref: Bell 206A/206B/206L/407 Maintenance Manual, Chapter 27/67	Supplemental ICA ref: Section 67-1 thru 67-3
A527.3 (b) (4) General (4) Other general procedural instructions including procedures for system testing during ground running, symmetry checks, weighing and determining the center of gravity, lifting and shoring, and storage limitations.	ICA ref: Bell 206A/206B/206L/407 Maintenance Manual, Chapter 7 and 8	Supplemental ICA ref: N/A
A527.3 (c) Access (c) Diagrams of structural access plates and information needed to gain access for inspections when access plates are not provided.	ICA ref: N/A	Supplemental ICA ref: N/A
A527.3 (d) Special inspections (d) Details for the application of special inspection techniques including radiographic and ultrasonic testing where such processes are specified.	ICA ref: Bell 206A/206B/206L/407 Maintenance Manual, Chapter 5	Supplemental ICA ref: Section 5
A527.3 (e) Protective treatment (e) Information needed to apply protective treatments to the structure after inspection.	ICA ref: Bell Standard Practices Manual BHT-ALL-SPM, Chapter 3	Supplemental ICA ref: N/A
A527.3 (f) Fasteners, torque values, etc (f) All data relative to structural fasteners such as identification, discard recommendations, and torque values.	ICA ref: Bell Standard Practices Manual BHT-ALL-SPM, Chapter 2	Supplemental ICA ref: N/A
A527.3 (g) Special tools (g) A list of special tools needed.	ICA ref: N/A	Supplemental ICA ref: N/A

MSI 53 – Review of Supplemental Instructions for Continued Airworthiness

BLOCK 3

Note: The statement in block 5 does not constitute an approval of the Airworthiness Limitations Section. Airworthiness Limitations differ from other maintenance tasks, in that they are mandatory, as a direct condition of the approval of the type design. They are therefore referenced directly in the approval document itself. However, they must also be included in the Supplemental Instructions for Continued Airworthiness.

A527.4 AWL - Separate Section 1 The Instructions for Continued Airworthiness must contain a section titled Airworthiness Limitations that is segregated and clearly distinguishable from the rest of the document. This section must set forth each mandatory replacement time, structural inspection interval, and related structural inspection procedure approved under 527.571 . If the Instructions for Continued Airworthiness consist of multiple documents, the section required by this paragraph must be included in the principal manual. This section must contain a legible statement in a prominent location that reads: "The Airworthiness Limitations section is approved by the Minister and specifies maintenance required by any applicable airworthiness or operating rule unless an alternative program has been approved by the Minister."	ICA ref: Bell 206A/206B/206L/407 Maintenance Manual, Chapter 4	Supplemental ICA ref: Chapter 4
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BLOCK 4 – Applicant Statement of Compliance

The Supplemental ICA referenced above comprises the complete listing of supplemental ICA necessary to show compliance with the regulatory standard that supports this change in type design.

Applicants Signature:  Date: 07 August 2014

Applicants Name: Jeff Clarke, Vice President

BLOCK 5 – Minister's Statement of Acceptability

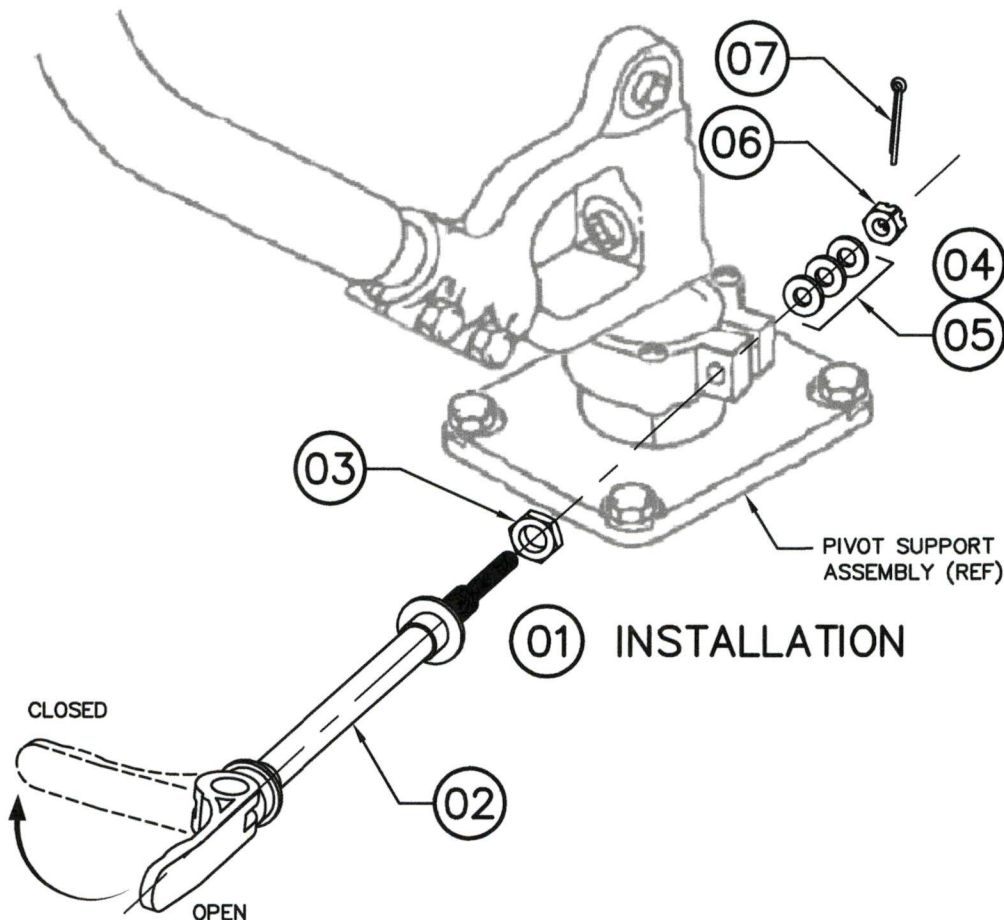
The design change is adequately supported by existing ICA and/or supplemental ICA, as identified above and is acceptable to the Minister.

Reviewer's Name: _____ Phone # _____ Email: _____ Mail Routing Symbol: _____

Signature: _____ Date: _____ NAPA Number: _____

THIS DRAWING CONTAINS INFORMATION AND DATA WHICH IS PROPRIETARY TO AERO DESIGN LTD. THIS DRAWING, OR ANY PORTION THEREOF, MAY NOT BE REPRODUCED, COPIED, OR DUPLICATED IN ANY MANNER, NOR USED FOR MANUFACTURING WITHOUT THE WRITTEN CONSENT OF AERO DESIGN LTD. BY ACCEPTING THIS DRAWING FOR REFERENCE, THE RECIPIENT AGREES TO HOLD AERO DESIGN LTD. HARMLESS FROM THE USE, OR MISUSE, OF THIS DRAWING OR THE INFORMATION CONTAINED THEREON.

REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE - CREATED FROM 95201, REV. 0		



NOTES

- REMOVE THE EXISTING CYCLIC FRICTION ASSEMBLY AS FOLLOWS:
 - REMOVE PILOT SEAT AND SEAT PANEL. REFER TO MAINTENANCE MANUAL CHAPTER 25.
 - REMOVE COTTER PIN, NUT AND WASHERS AT BOTTOM OF CYCLIC FRICTION KNOB AND SHAFT ASSEMBLY.
 - UNTHREAD KNOB AND SHAFT ASSEMBLY FROM PIVOT SUPPORT ASSEMBLY, AND SLIDE OUT OF CYCLIC STICK BOOT.
- INSTALL NEW CYCLIC FRICTION ASSEMBLY (02) AS FOLLOWS:
 - THREAD CHECK NUT (03) ONTO FRICTION ASSEMBLY (02).
 - SLIDE CYCLIC FRICTION ASSEMBLY (02) THROUGH CYCLIC BOOT, THREAD FRICTION ASSEMBLY INTO PIVOT SUPPORT ASSEMBLY, 0.4" (10 mm) MIN.
 - TORQUE CHECK NUT TO 60-85 IN-LBS (6.8-9.6 N-m).
 - SLIDE WASHERS (04/05) (AS REQUIRED, SEE F.) ONTO THREADED END OF CYCLIC FRICTION.
 - THREAD CASTLE NUT (06) ONTO THREADED END OF CYCLIC FRICTION.
 - WITH FLIGHT CONTROLS DISCONNECTED OR HYDRAULIC POWER CART CONNECTED, SET FRICTION LEVER IN OPEN POSITION (STRAIGHT OUT), ADJUST MINIMUM FRICTION BY INSERTING WASHERS (04/05) AND TIGHTENING NUT (06) FINGER TIGHT UNTIL A SPRING SCALE, APPLIED AT THE CENTER OF THE GRIP, INDICATES A BREAKAWAY FORCE OF 1.0 ± 0.5 LBS (4.4 ± 2.2 N). A MAXIMUM OF 8 WASHERS MAY BE USED TO POSITION NUT IN LINE WITH COTTER PIN HOLE IN ROD.
 - SAFETY THE CASTLE NUT (06) WITH COTTER PIN (07) IN ACCORDANCE WITH AC43.13-1B, SECTION 7-127.
 - APPLY BEAD OF F-900 TORQUE SEAL (OR EQUIVALENT MOVEMENT INDICATION LACQUER) TO CHECK NUT / PIVOT SUPPORT JOINT.
 - INSTALL PILOT SEAT AND SEAT PANEL. REFER TO MAINTENANCE MANUAL CHAPTER 25.
 - PILOT MAY INCREASE FRICTION BY FOLDING LEVER TO CLOSED POSITION.
- ELIGIBILITY: 206A - ALL
206B - UP TO S/N 1651

A/R	F-900	08	TORQUE SEAL (OR EQUIVALENT)
1	MS24665-153	07	COTTER PIN
1	AN310-3	06	CASTLE NUT
A/R	NAS1149F0332P	05	WASHER (LIGHT)
A/R	NAS1149F0363P	04	WASHER
1	AN316-5R	03	CHECK NUT
1	95240-01	02	CYCLIC FRICTION ASSEMBLY
	95202-01	01	CYCLIC FRICTION INSTALLATION
01	PART NO.	ITEM	DESCRIPTION
QTY	LIST OF MATERIALS		

APPROVALS	DATE
DRAWN: JEFF CLARKE	20 MAR 2014
CHECKED: JASON REKVE	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON:	
DECIMALS	ANGLES
X.XXX ± 0.010	$\pm 1/2^\circ$
X.XX ± 0.03	
X.X ± 0.1	



AERO DESIGN LTD.

9888A MALASPINA ROAD
POWELL RIVER, BC, CANADA, V8A 0G3
TEL: 604.483.2376 www.aerodesign.ca

BELL 206A, 206B - UP TO S/N 1651
CYCLIC FRICTION REPLACEMENT
INSTALLATION

NOT TO SCALE	DWG. SIZE	DWG. NO.	REV.
SHEET 1 OF 1	A4	95202	0

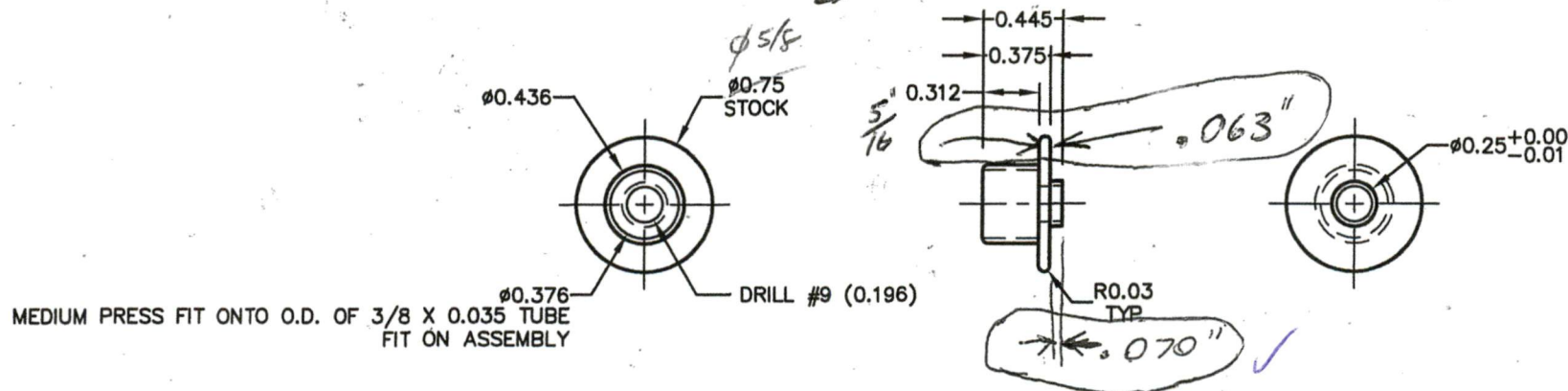
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REV.	DESCRIPTION OF CHANGE	INITIALS	DATE
0	INITIAL ISSUE	*	*

NOTES

1. REMOVE ALL BURRS AND BREAK SHARP EDGES.

change this dim. ✓



01 CAP

		95224-01		01	CAP		304 STAINLESS STEEL		ASTM A479		#0.75 ROD		
01		PART NO.		ITEM	DESCRIPTION			MATERIAL		MATERIAL SPEC		STOCK SIZE	
QTY		LIST OF MATERIALS											
					APPROVALS		DATE		AERO DESIGN LTD. CONSULTING ENGINEERS, TRANSPORT CANADA APPROVALS, DAR 290M 2013 - 39TH AVENUE N.E., CALGARY, ALBERTA, CANADA, T2E 6R7 tel: (403) 250-8087 fax: (403) 250-8883 www.aerodesign.ca				
					DRAWN: JEFF CLARKE		18 OCT 2012						
					CHECKED: E. BURGAIN				BELL 206B, 206L SERIES, 407 CYCLIC FRICTION REPLACEMENT PARTS - CAP				
					UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ON: DECIMALS ANGLES X.XXX ±0.010 ±1/2" X.XX ±0.03 X.X ±0.1								
					SCALE 1 : 1		DWG. SIZE		DWG. NO.		REV.		
					SHEET 1 OF 1		A4		95224		0		